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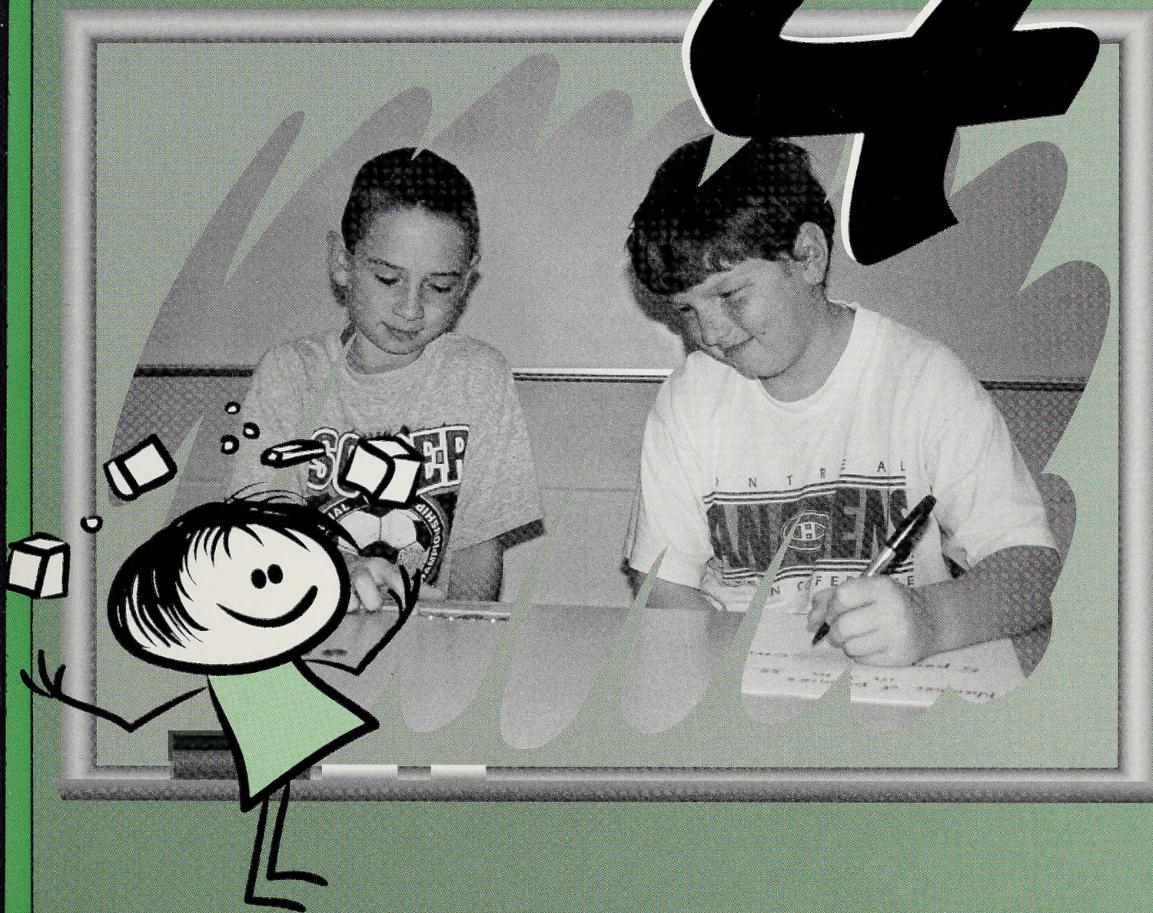


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# Mathematics

## Module 2

# 4




## Number Concepts and Patterns



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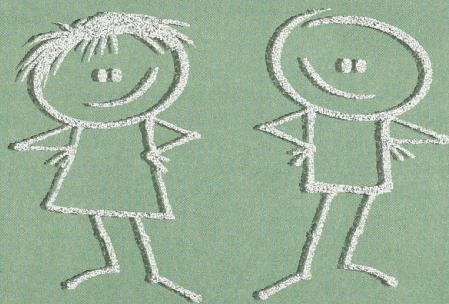
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# Mathematics 4

## Module 2 Number Concepts and Patterns





Mathematics 4  
Module 2: Number Concepts and Patterns  
Student Module Booklet  
Learning Technologies Branch  
ISBN 0-7741-1875-x

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	



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<http://www.learning.gov.ab.ca/ltb>

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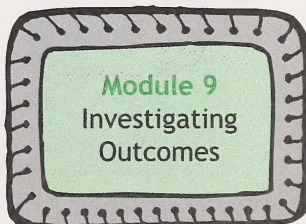
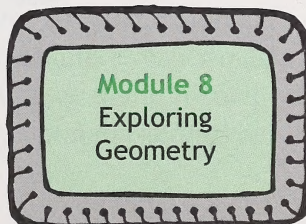
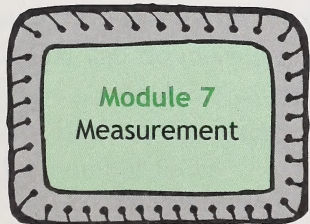
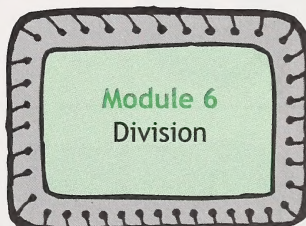
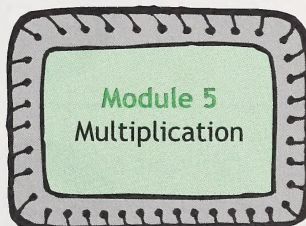
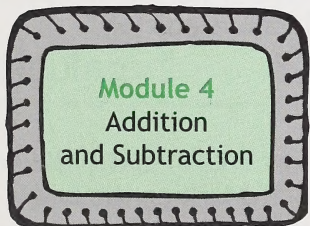
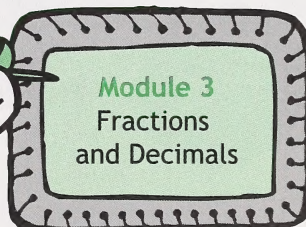
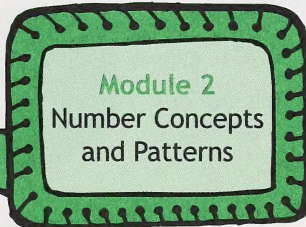
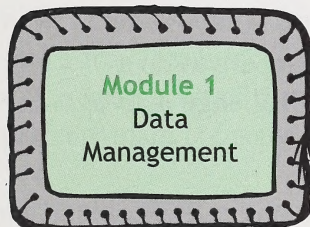




# Welcome!

Mathematics 4 contains nine modules. Work through the modules in the order given, since several concepts build on each other as you progress through the course.

## Mathematics 4







The book you are presently reading is called a Student Module Booklet. You will find icons used throughout it. Read the following explanations to find out what each icon tells you to do.



Pay close attention to important words or ideas.



Refer to the textbook *Quest 2000: Exploring Mathematics*.



Use manipulatives, cut-out learning aids, or pull-out pages.



Do an activity to review the concept.



Use a calculator.



Prepare to do a Challenge activity.



Do an activity just for fun!



Do an activity with your home instructor.



Use the Internet.



Use the Answer Key to Self-Marking Activities in the Appendix to correct activities.





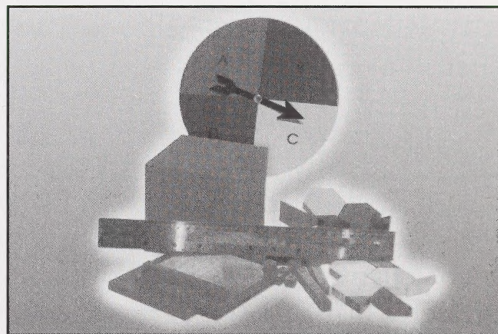


# Information for the Student

The Grade 4 Mathematics course is designed to keep you actively involved in learning as you progress through the daily lessons in each of the nine modules. Besides the Student Module Booklets, you will also need a copy of the Grade 4 Mathematics textbook called *Quest 2000: Exploring Mathematics*. The textbook contains pictures, information, questions, and problems that are referred to in the modules. Each module also requires you to complete one or more Assignment Booklets to be sent to your teacher for marking.

## Manipulatives

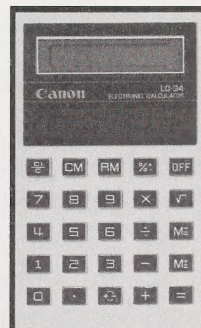
Manipulatives are hands-on materials that you will be using to help you learn new concepts and ideas. They include things like base ten blocks, geoboards, spinners, counters, polygon shapes, tiles, rulers, and metre-sticks. Don't worry if you don't have all of these manipulatives. Some can be found in the Cut-Out Learning Aids section of the Appendix in several of the modules. Some you may be asked to make from materials found in your own home. However, it is highly recommended that you have a set of base ten blocks. They will be used often to help you to understand many new math concepts.



You should use manipulatives whenever you think they will help you understand something new you are learning. Manipulatives can also be useful when you are sharing or discussing what you know with your home instructor.

## Calculators

You will need a calculator for many of the activities in Mathematics 4. It is important to remember that a calculator is a tool to be used when doing difficult calculations and when investigating what numbers can do. Don't rely on the calculator for calculations that you can do in your head. For example, you would not use a calculator when estimating or doing mental math. Both of these activities rely upon mastering the basic number facts.

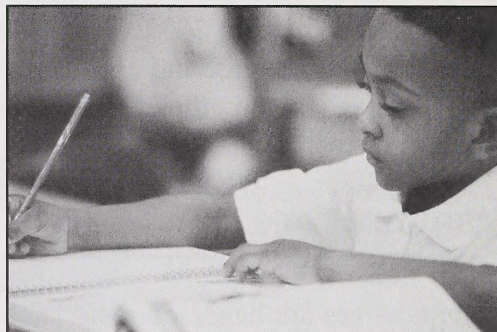




## Basic Number Facts

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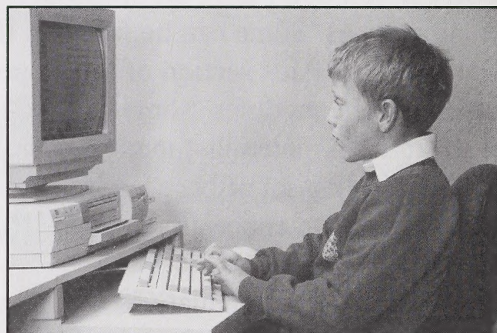
You will practise the basic facts on several days of each module. Each drill is timed to encourage you to work quickly. At first, you may not do very well because you may not know all of the number facts yet, or you may have forgotten some of the number facts you learned last year. Don't worry. By practising the facts regularly, your scores will improve over time. Strategies to help you learn the number facts will be presented in the lessons.



## Computers

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If you have your own computer at home, you may already know some computer software programs that help you to learn mathematics. There are also many websites on the Internet that provide math activities for students to do. Throughout this course, you will find optional activities that refer to software programs and Internet websites. You should do these activities only when you have finished the daily assigned work. **Note:** Always check with your home instructor before you log onto the Internet. **Remember that any Internet website address given in this module is subject to change.**



## Journal Writing

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In each Assignment Booklet, you will often be asked to complete a journal entry about something you have been learning in the module. Being able to put into your own words what you have learned is an important skill. It will help you think about what you know as well as help your teacher understand your thinking.



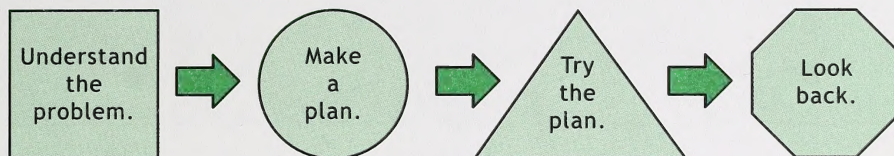




# Problem-Solving Skills

You are already familiar with problem solving from earlier grades. This course will continue to help you develop strategies to make you a better problem solver. There are four steps that can be used to solve most problems.

## The Four-Step Process



### Step 1

Understand the problem.

In this step, you need to spend time reading over the problem in order to understand what you are being asked to find. One way to see if you understand the problem is to cover it up and then try restating it in your own words. Sometimes it might seem like not enough information is given. If this happens, try asking yourself the question, “What do I already know that will help me solve this problem?”

### Step 2

Make a plan.

In this step, you decide on the method or strategy you will use to solve the problem. Different problems require different strategies. Most problems can be solved in more than one way. In this course, you will be looking at the following seven strategies:

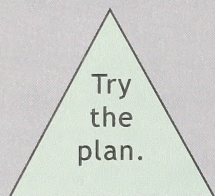
- acting out the problem
- guessing and checking
- making an organized list
- drawing a diagram
- making a table or chart
- looking for a pattern
- making it simpler

You will be introduced to these strategies as you move through the modules. However, you may review each of the strategies at any time by turning to the Appendix of Module 1.

Remember, there is no one “right” way to solve a problem. The method or strategy you use may be different than the one your home instructor or someone else doing the problem would use. Sometimes you will find that more than one strategy on the list can be used to solve a problem. In fact, sometimes you may decide to invent a strategy of your own that is not even on the list.



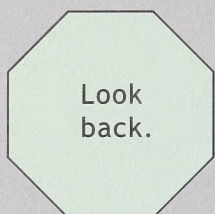
### Step 3



In this step, you try out one of your strategies to see if it works to solve the problem. Don't worry if you can't find the answer immediately. Some problems take more than one step. You may also find it necessary to use your calculator to do some of the calculations.

Sometimes, as you try to solve the problem, you'll find that your strategy isn't working. Don't give up. Try another method instead.

### Step 4



In this step, you take time to look at your answer and ask, "Is my answer reasonable? Does it make sense?" Writing your answer in a complete sentence may help you to see if, in fact, you have answered the question. If not, you may have to check your calculation for errors or, perhaps, try another strategy.

This is also a good time to look at the strategy you used and to think about how you could use it again in other problem-solving situations. Take time to share your strategies with your home instructor, and compare your method with the strategy your home instructor might use.



Remember, problem solving is a skill you need and will use throughout your life. The more practice you have with solving problems, the better your problem-solving skills become. Problems don't always have just one "right" answer. Some problems have several possible answers, just as some problems may be solved in several different ways.



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Send in Assignment Booklet 2B.

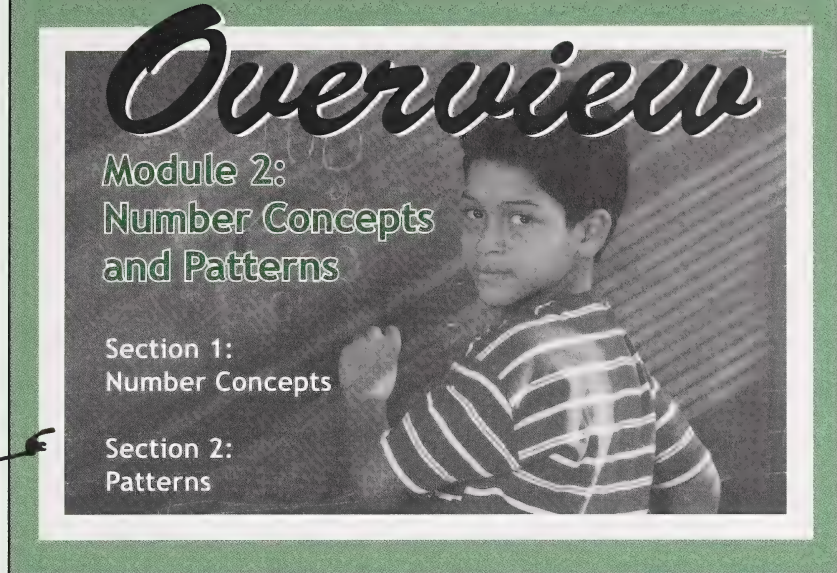
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## Module 2: Number Concepts and Patterns

Imagine a world without numbers. Things would be very different, wouldn't they? If there were no numbers, would you be able to count? If you couldn't count, would you be able to tell

- your age, your weight, or your height?
- the time?
- how far you've travelled?
- how much money you have?
- the score of a football game or hockey game?



Numbers are everywhere, so it's important that you learn as much as you can about numbers, the number system, and how numbers can be used.

Module 2 is divided into two sections. In Section 1: Number Concepts, you will explore how numbers can be shown, how they are used, and why place value of numbers is so important. In Section 2: Patterns, you will look at many kinds of patterns.



There are **two** Assignment Booklets for Module 2.

You should send in Assignment Booklet 2A after completing Day 10.

You should send in Assignment Booklet 2B after completing Day 18.



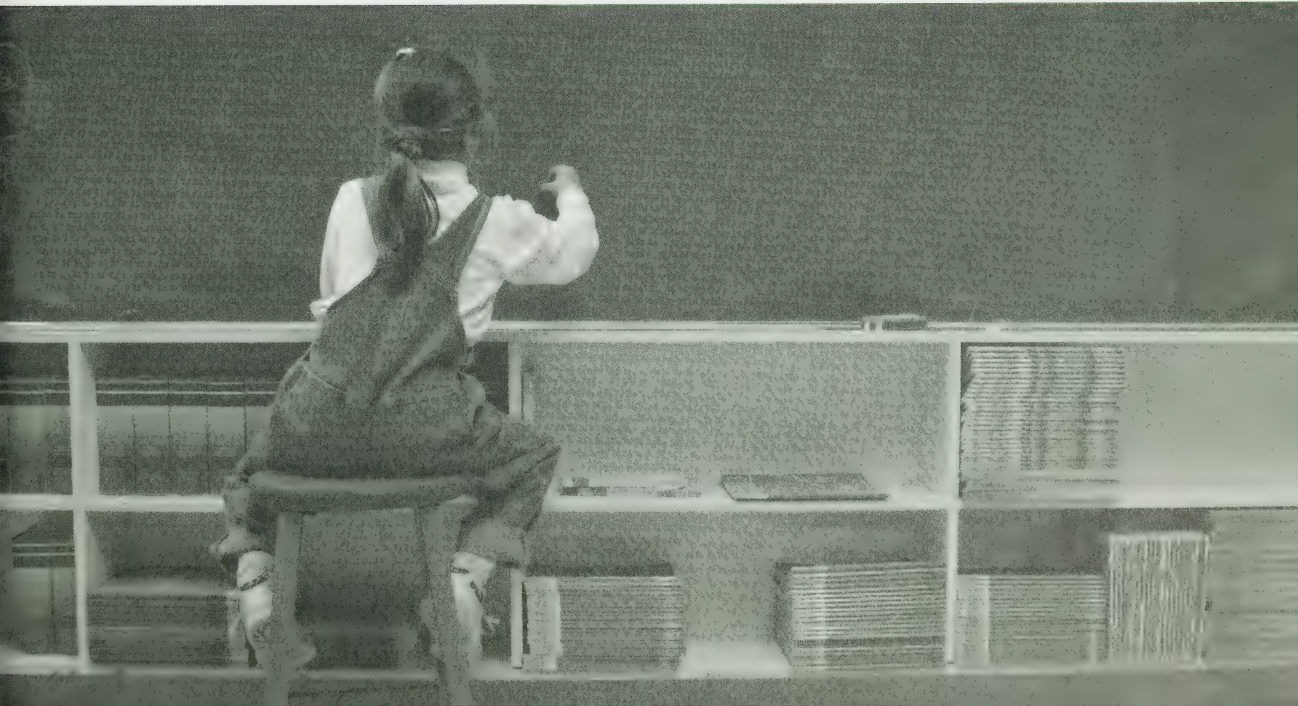






# Section 1

## Number Concepts







## Numbers



Elmo and Bart hurried through the crowded school hallway on their way to the library. Miss Clements, their Grade 4 Science teacher, had just given out the topic for the first science report. Both boys were anxious to get started.

“Come on, Bart. Let’s go,” said Elmo. “I want to get started on my report.”

“Me too,” replied Bart. “I want to get to the library before all the good books are gone. I sure hope I can find the books I need. Last year it took me forever to even find one book I could use.”

“You should have asked the librarian. She helped me. She showed me how to look on the spine of a book for the book’s number.”

“You mean every book has a number? What good is that?” Bart asked.



“The number tells you what kind of book it is and where it’s found in the library. If it’s an information book on animals, then it’s a science book. All science books have numbers either in the 500s or 600s. Books with 590 on them are all animal books. Books with 580 on them are books about plants. And books with 520 on them are about stars and planets. It’s called the Dewey Decimal System.”

Bart looked at Elmo as they entered the library and asked, “How is a person supposed to remember all those numbers? There must be more than a million books in here!”

Elmo replied, “You don’t have to remember the numbers. They’re all in the card catalogue or the online catalogue. In our library, all you have to do is type the topic you’re looking for into the computer and it will show you the title and the book’s number. Once you know the number you’ll know where to look for the book on the shelves.”

“So if my report is on dinosaurs, I type in *dinosaurs*, and the computer will tell me the numbers of all the dinosaur books that are in the library?”

“That’s right. Over the summer I read a lot of dinosaur books, so I already know that dinosaur books are in the 560s,” announced Elmo.

“Then let’s go find them before someone else does!”

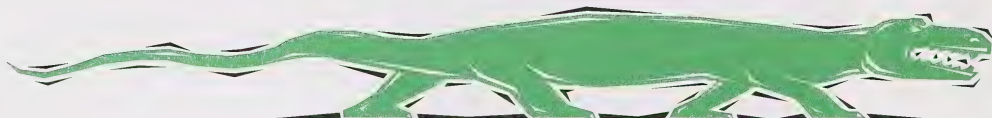
Elmo smiled. “I think they’ve got enough books for everyone. Come on, I’ll show you.”





Numbers are important. In the story, you saw how numbers can help you find books in a library. By looking at the number on the spine, you can tell what a book is about without knowing its title or anything else about the book. The number also helps you locate the book on the shelves.

Bart thought his school library had over a million books. About how many books do you think are in your local library? To answer this question, you need to use the skill of **estimating**. To estimate, you need to use numbers.



In this section, you will

- see how numbers are important in everyday life
- use numbers for estimating and for counting
- explore place value and different ways of writing numbers
- compare numbers
- practise rounding whole numbers
- solve number problems

Get ready to learn lots of new things about numbers!



# Numbers! Numbers! Numbers!

Numbers are everywhere! Numbers have many interesting qualities:

- Numbers can be large.
  - populations of countries
  - distances in space
  - the number of cells in the human body



- Numbers can be small.
  - the time it takes to blink an eye
  - the space between two atoms
  - the size of a dust mite

- Numbers can make patterns.

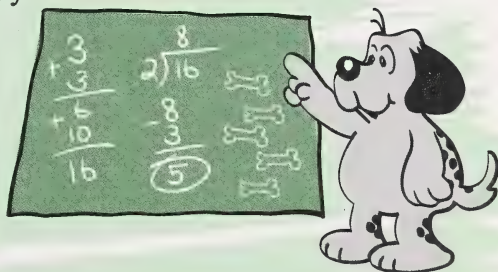
- 6, 96, 969, 6969, 69 696, 969 696
- 123, 345, 567, 789
- 1, 11, 111, 1111, 11 111, 111 111

22222222	33333333
2222222	33333333
222222	33333333
22222	33333333
2222	33333333
222	33333333
22	33333333
2	33333333

- Numbers can do tricks.

Try this trick with someone in your family.

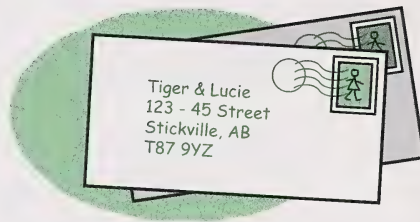
- Choose a number.
- Double it.
- Add 10.
- Divide by 2.
- Subtract the number you started with.
- The answer is 5. (Always!)





• Numbers can give information.

- addresses
- phone numbers
- ages
- dates and times
- heights and weights
- identifications



• Numbers can be used to write secret messages.

4-5-1-18 2-1-18-20,  
13-5-5-20 13-5 1-6-20-5-18  
19-3-8-15-15-12 1-20 13-25  
8-15-21-19-5.  
5-12-13-15

1. Make up a pattern of your own using the numbers 0 to 9.

---

2. a. Write your address. Include your postal code.

---

---

---

b. How many numbers are in your address? \_\_\_\_\_ numbers

3. a. Write your phone number. Include your area code.

---

b. How many numbers are in your phone number? \_\_\_\_\_ numbers

4. Write your age in years. \_\_\_\_\_ years



5. Write your birthdate using the day/month/year format.

**Example:** 24/07/91

---

6. a. Write your height in centimetres. \_\_\_\_\_ cm

b. Write your weight in kilograms. \_\_\_\_\_ kg

7. a. Write a licence-plate number you have seen on a car.

---

b. Name **four** other places numbers can be used to identify something.

---

---

8. Decode the following message. Use the code A = 1, B = 2, C = 3, and so on.



14 21 13 2 5 18 19

1 18 5

5 22 5 18 25 23 8 5 18 5

Check your answers in the Appendix.



Are you starting to see how important numbers are? Numbers are used in so many ways every day. Can you think of other ways you have used numbers recently?

Did you have to count anything, measure anything, or use anything with a number on it? Did you

- use the telephone?
- choose a TV channel?
- turn to a page in a book?
- measure an ingredient for a recipe?
- buy something at the store?



If you did any of these things, you were using numbers!

9. Think of **four** ways you have used numbers today.

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



Check your answers in the Appendix.



## Using a Calculator

Solving a math problem usually involves working with numbers. Finding an answer often means using one of the four math **operations**.

- addition
- subtraction
- multiplication
- division

A calculator can be useful for doing these operations. It can help you work through long or difficult **computations**. Calculators do not solve problems. They are tools to help you solve problems.

In day-to-day life, people are faced with many real-life math problems. Sometimes an estimate is all that is needed. If so, a calculator would not be necessary.

### Example



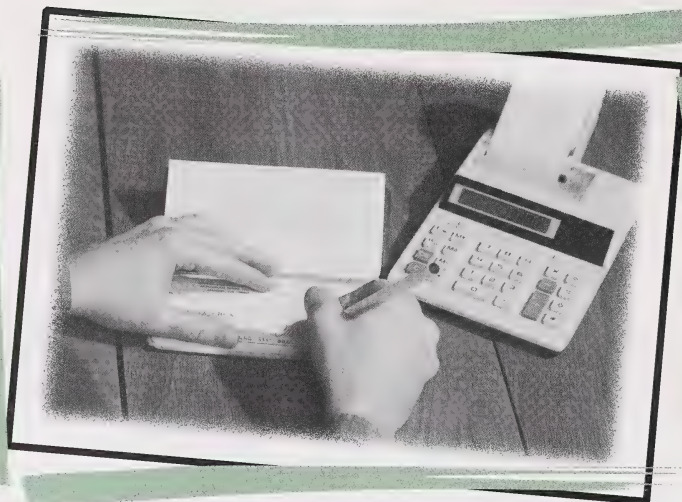
You are going out to a movie that starts at 8:00 P.M.  
How do you know when to leave?

You know it takes about 20 minutes to get to the theatre.  
You want to leave time to buy a ticket and find a seat before the movie starts. Therefore, you **estimate** that by leaving about 30 minutes ahead of time you will likely have enough time.

Sometimes a calculator is necessary. You might use a calculator to

- total the amount of a grocery bill
- calculate your income tax
- pay many bills with one cheque

You use a calculator when you need to calculate the exact amount. Paper and pencil could also be used.



10. Ask members of your family what method they use to make the following calculations.

- a. adding up numbers in a chequebook \_\_\_\_\_
- b. time needed to prepare supper \_\_\_\_\_
- c. calculating how much gas the family car uses \_\_\_\_\_



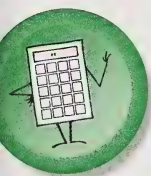
Check your answers in the Appendix.

As you work with numbers this year, one of the decisions you will need to make is which method of calculation is best suited to solving the problem you are working on.

You might want to use one of these methods:

- using a calculator
- doing paper-and-pencil calculations
- doing calculations mentally
- giving an approximate answer by estimating





**Use a calculator to solve the following problems.**

- 11.** Add any three numbers together so that the answer is between 1200 and 1300. Write your numbers in the spaces provided.

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

- 12.** Subtract one number from another so that the answer is more than 750 and less than 850. Write your numbers in the spaces provided.

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

- 13.** Multiply two numbers together so that the answer is more than 1000 and less than 1500. Write your numbers in the spaces provided.

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

- 14.** Divide one number by another so that your answer is less than 50 and more than 40. Write your numbers in the spaces provided.

$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$



**Check your answers in the Appendix.**

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Turn to Assignment Booklet 2A, and complete the activities for Day 1.

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## Estimating How Many

Last day you read about how numbers are used in a library to help you locate books. Most libraries have many books. Bart thought his school library had over a million books. If you were Bart, how could you check to see if there really are a million books? Would you have to count every book?

Look at the following picture. Without counting, can you tell how many candies are in the bowl?



The guess you make about the number of candies in the dish or the number of books in the library is called an **estimate**.

An estimate is not an exact number. It is an approximate number.

Estimating is a skill that uses numbers.



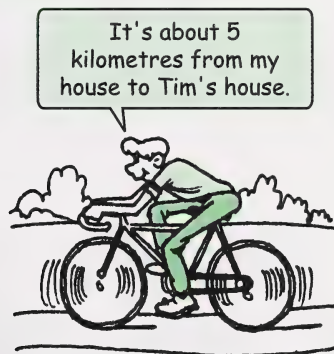
## Using Estimation

You use estimation every day, so learning to be a good estimator is important. People use estimation when they talk about such things as the following:

### Time



### Distance



### Weight (mass)



### Money



Note that in these cases it's really not important that you use exact numbers.

The same is true when large numbers are used. When people talk about a large number of objects, they will often give an estimate if an exact number isn't needed.

1. Which sentence in each pair is most likely be used in everyday conversation? Put a check mark (✓) beside your choice.

a. \_\_\_\_\_ The average person has 8965 taste buds.

\_\_\_\_\_ The average person has about 9000 taste buds.

b. \_\_\_\_\_ Some cows can produce up to 8724 litres of milk per year.

\_\_\_\_\_ Some cows can produce almost 9000 litres of milk per year.

c. \_\_\_\_\_ There were 9268 people at the hockey game.

\_\_\_\_\_ There were more than 9000 people at the hockey game.



Check your answers in the Appendix.

Did you find that in each case, the second sentence (using estimation) is the kind of sentence used by most people in everyday conversation?

2. a. What is the population of the town or city you live in or near? (If you don't know, think of someone you could ask.)

The population is \_\_\_\_\_.



- b. Do you think this number is an estimate or the exact number of people? Explain why you think so.

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Check your answers in the Appendix.

### How Many in the Jar?



Ask your home instructor to fill a glass jar with dry macaroni or any other small, similar objects. Use the jar to answer the following questions.

#### Note to the Home Instructor

In this activity, the student is asked to estimate and then count several hundred small objects in a jar. You should use a jar large enough to hold approximately 500 to 600 small, similar objects (such as dry macaroni, beads, buttons, pennies, dry beans, or unpopped popcorn kernels).

3. a. How many objects do you think are in the container? \_\_\_\_\_

b. How did you make your guess?

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c. Do you think you have a good chance of being exactly right? \_\_\_\_\_

d. How could you get closer to the actual number without counting every object in the container? Describe what you would do.

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4. Turn to page 34 of the textbook to see some estimation methods you could try. Which of these four methods do you think would work best in helping you estimate how many objects are in your container? Explain why you think so.

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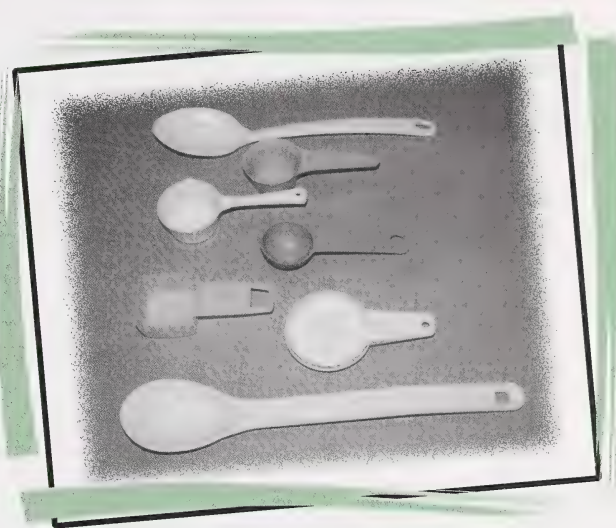
Check your answers in the Appendix.



## Using the Portion Method

You can use a **portion** of the objects to make a closer estimate of the number of objects in your container. Perhaps you could use

- a large spoon
- a scoop
- a small cup
- your hand



5. Think of something else you have in your home that you could use to measure a portion of the objects.
- 



6. The more information you have before you estimate or make a guess, the better your estimate will be. Tell how you could use the **portion method** to revise your first estimate from question 3.a.

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7. Make a new estimate about the number of objects using the portion method of counting.

My revised estimate is \_\_\_\_\_.



Check your answers in the Appendix.

Now, carefully count to find the **actual number** of objects in the container. If you have a large number of objects to count, it is a good idea to organize them as you count so that you can keep track of the number. Paper cups, saucers, or small dishes could be used to hold groups of 50 or 100 objects.

8. a. The actual number of objects I counted is \_\_\_\_\_.

b. My revised estimate (from question 7) was \_\_\_\_\_.

c. How close was your revised estimate to the actual number?

\_\_\_\_\_

d. How close was your first estimate (from question 3.a.) to the actual number? \_\_\_\_\_

e. Which estimate was closer? \_\_\_\_\_



Check your answers in the Appendix.



You will discover more about estimating in Day 3. For now, take a bit of a break and work on mental math skills.

## Mental Math



In Module 1: Data Management, you learned the importance of developing good mental math skills. You also examined some strategies to help you do this. Today, look at a strategy you can begin practising to help you develop good mental **addition** skills.

### Strategy: Breaking Numbers into Their Parts

#### Example 1

$$37 + 42 = ?$$

To make this easier to do in your head, break the second number into its parts; then add the parts one step at a time.



**Step 1:** Break 42 into 40 and 2.

**Step 2:** Add 40 to the first number.

$$\begin{array}{r} 37 + 40 \\ \hline \end{array} \rightarrow 77$$

**Step 3:** Add 2 to your first total.

$$\begin{array}{r} 77 + 2 \\ \hline \end{array} \rightarrow 79$$

So,  $37 + 42 = 79$ .

## Example 2

$$35 + 44 = ?$$

**Step 1:** Break the second number into two parts: 40 and 4.

**Step 2:** Add 40 to the first number.

$$\begin{array}{r} 35 + 40 \\ \hline \end{array} \rightarrow 75$$

**Step 3:** Add 4 to your first total.

$$\begin{array}{r} 75 + 4 \\ \hline \end{array} \rightarrow 79$$

So,  $35 + 44 = 79$ .

9. Now try the following questions in your head. Remember to break one of the numbers into two parts.

a.  $43 + 55 = \underline{\hspace{2cm}}$

b.  $21 + 68 = \underline{\hspace{2cm}}$

c.  $27 + 31 = \underline{\hspace{2cm}}$

d.  $24 + 43 = \underline{\hspace{2cm}}$

e.  $82 + 54 = \underline{\hspace{2cm}}$

f.  $12 + 56 = \underline{\hspace{2cm}}$

g.  $22 + 43 = \underline{\hspace{2cm}}$

h.  $67 + 32 = \underline{\hspace{2cm}}$

Check your answers in the Appendix.



Turn to Assignment Booklet 2A, and complete the activities for Day 2.





## Measuring and Estimation



Last day you learned about estimation and how important it is to have good estimation skills. You used guessing and the portion method to make estimates. Today you will look at another way to use the portion method to help you estimate. Instead of counting, you will use a ruler to measure the portion.

### Pennies in a Line



For this activity, you will need a metre-stick or a tape measure that can measure 1 metre. (If your work area is large enough, you can measure out a strip of masking tape that is 1 m long and mark off the centimetres.) You will also need a pile of pennies (about two handfuls).



1. Look at the 1-m length and estimate how many pennies you think it would take to make a row that is 1 m long.

My estimate: \_\_\_\_\_ pennies

Now lay out five pennies in a row along the metre-stick.

2. a. About how many centimetres long is a row of five pennies?

\_\_\_\_\_ cm

- b. How could this information help you make a closer estimate of the number of pennies that will be in 1 m?

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Check your answers in the Appendix.



Knowing how much space a row of five pennies takes up should help you revise your estimate about the number of pennies in 1 m.

3. My revised estimate: There are \_\_\_\_\_ pennies in 1 m.

Now lay out pennies the whole length of the metre-stick to find the actual number needed.

4. Actual number: There are \_\_\_\_\_ pennies in 1 m.



5. Was your first or second estimate closer to the actual number? Explain why.

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Check your answers in the Appendix.

## How Many Staples?

Have you ever had to refill a stapler that had run out of staples? If you have, you'll know that staple refills often come in strips that are about 10 centimetres long.



6. Without counting, estimate how many staples you think there are in a 10-cm strip.

My estimate: \_\_\_\_\_ staples

7. Can you think of a better way to estimate than by just looking and guessing?

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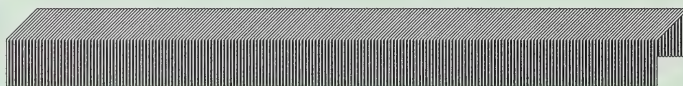
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Check your answers in the Appendix.

8. In one brand of staples, there are about 20 staples in 1 cm. About how many staples would there be in 10 cm? How did you decide?



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Check your answers in the Appendix.

The portion method is a good method to try whenever you are trying to make an estimate. It will usually give you a closer or more accurate estimate than by simply guessing.





## Using Estimation When You Measure

Danielle was helping her dad clean up the kitchen after lunch. She knew the leftover soup had to go into the fridge, but first she needed to choose the right size of container to hold all of the soup. She didn't want the container to be too large or too small.

"How will you decide?" asked her dad.

"I could use a measuring cup and measure how much soup is in the pot," said Danielle. "Then I could choose a container, fill it with water, and measure how much water the container holds. Then for sure I'd know if all the soup would fit in the container. But there must be an easier way."

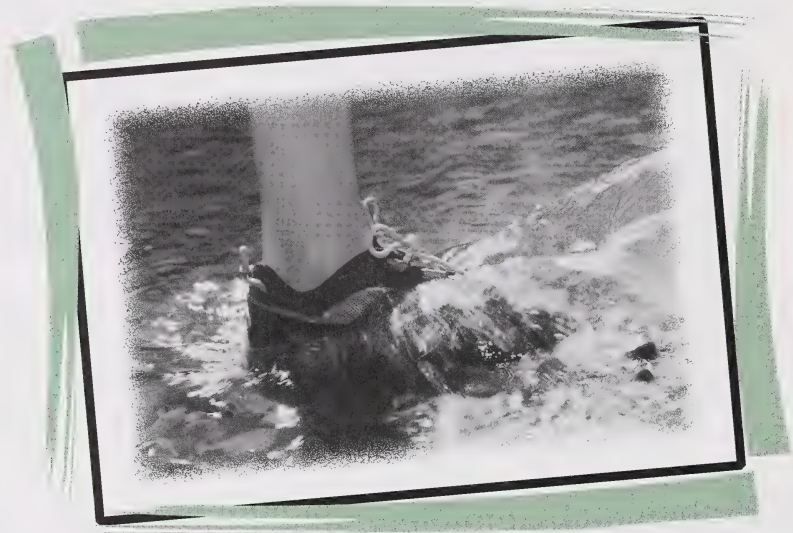


"You're right," said Danielle's dad. "Most people wouldn't go to all that trouble. They'd estimate instead. If it were me, I'd look at the amount of soup and say something like, 'For this much soup I need a container that's about this big.' If I'm wrong, and there's too much soup, I have to find a larger container."

Danielle looked closely at the three containers she had found and at the amount of soup in the pot. "Well, for this much soup I think the blue container will be just right." Carefully, she began pouring the soup into the container until it was nearly full. "Uh-oh! I don't think it's all going to fit. There's still some left in the pot. But don't worry, Dad. I know how to solve this problem. I'll eat what's left in the pot!"

In this story, Danielle decided on the size of container she needed by estimating. Can you think of times when you've measured something using your estimation skills?

- Did you ever try jumping across a stream or over a puddle? To solve this problem, you first had to estimate how wide the water was. If you estimated correctly, you probably managed to get to the other side without getting your feet wet. If you landed in the water, you knew you had underestimated the distance.



- Have you ever tried to put something away on a high shelf? If you have, you were using your estimation skills. You had to estimate the height of the shelf; then you had to decide if you could reach it or not. If you decided the shelf was too high, you likely solved the problem by standing on a stool or chair.

Estimating is something people do all the time, but often they are not aware they're doing it. The more experience you have with estimating, the better you become at using estimation skills to solve problems in mathematics and in your daily life.



## Basic Number Facts Practice



Turn to the Number Fact Progress Chart for Module 2 in the Appendix. Remove the chart from the Appendix and hang it in your study area. You will use this chart to record your scores for the number facts drills in Module 2.

Ask your home instructor to time you as you complete the following timed exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

### Basic Number Facts Practice

#### Addition Number Facts

Number Completed in 2 Minutes \_\_\_\_\_


Number Correct in 2 Minutes \_\_\_\_\_

#### Subtraction Number Facts

Number Completed in 2 Minutes \_\_\_\_\_

Number Correct in 2 Minutes \_\_\_\_\_

Record your score on the Number Facts Progress Chart.



9. Addition Number Facts

Timed Exercise: 2 minutes

$$\begin{array}{r} 7 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ + 9 \\ \hline \end{array}$$

$8 + 6 =$

$5 + 7 =$

$8 + 3 =$

$9 + 9 =$

$4 + 8 =$

$$\begin{array}{r} 6 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 4 \\ \hline \end{array}$$

$8 + 9 =$

$7 + 8 =$

$5 + 6 =$

$8 + 8 =$

$6 + 9 =$

$$\begin{array}{r} 6 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 9 \\ \hline \end{array}$$



Check your answers in the Appendix.



**10. Subtraction Number Facts****Timed Exercise: 2 minutes**

$$\begin{array}{r} 13 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 7 \\ \hline \end{array}$$

$17 - 8 =$

$14 - 8 =$

$12 - 4 =$

$18 - 9 =$

$12 - 7 =$

$$\begin{array}{r} 14 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ - 9 \\ \hline \end{array}$$

$13 - 5 =$

$14 - 7 =$

$15 - 7 =$

$16 - 9 =$

$12 - 5 =$

$$\begin{array}{r} 16 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 8 \\ \hline \end{array}$$



Check your answers in the Appendix.





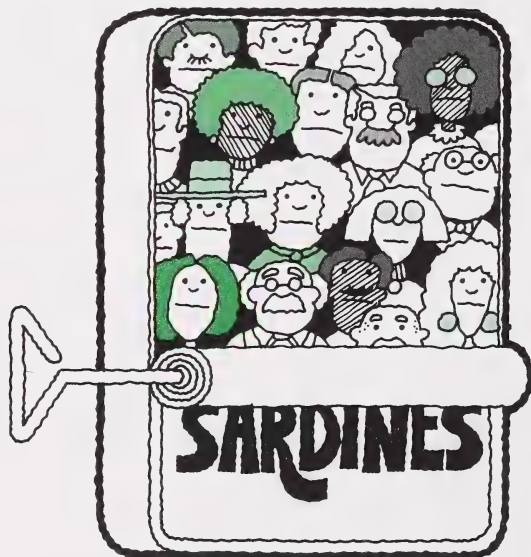
## Taking Another Look

The following activities are optional. You may choose to do them or not. You **should** complete the activities if you had difficulty with the questions in Day 2 or Day 3, or if you feel you just need more practice with estimation and counting.

If you choose **not** to do the questions at this time, you may wish to return here later to review the concepts on estimation and counting before completing the review activities for Day 9.

### Estimating and Counting

1. Estimate how many people there are in the following picture. Remember, in order to make a good estimate, you need to try to get as close as possible to the actual number without really counting all the objects.



My estimate: \_\_\_\_\_ people

2. What strategy did you use to estimate the number of people?

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3. a. Count the actual number of people and compare this number to your estimate.

Actual number: \_\_\_\_\_ people

b. How close were you?

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Check your answers in the Appendix.

Turn to Assignment Booklet 2A, and complete the activities for Day 3.



## Modelling Numbers

Do you or any of your friends have model planes, trains, cars, or other vehicles? Models look just like real objects, only they're much smaller. If you see a model, you can usually tell what the real object will look like.



You can make models of numbers, too. One of the most common ways to model numbers is to use base ten blocks. When you model a number, you see all of its parts, and you can tell how many of each part it has.

If you don't have a set of base ten blocks, you will need to cut out the paper models for Day 4 found in the Cut-Out Learning Aids section of the Appendix. Keep these cut-out learning aids in a plastic container or in a plastic bag because you will need them for future lessons.



## Using Base Ten Blocks



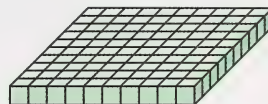
Today you will show how well you understand numbers by using **base ten blocks**. Use your base ten blocks to help you answer the following questions.



Unit cube



Tens rod



Hundreds flat

1.
  - a. What number does the unit cube stand for? \_\_\_\_\_
  - b. How many unit cubes or ones are there in a tens rod? \_\_\_\_\_
  - c. What number does the tens rod stand for? \_\_\_\_\_
  - d. How many unit cubes or ones are there in a hundreds flat? \_\_\_\_\_
  - e. How many tens rods are there in a hundreds flat? \_\_\_\_\_
  - f. What number does a hundreds flat stand for? \_\_\_\_\_



Check your answers in the Appendix.

2. This shows a tens rod (or a ten). In 1 ten, there are 10 unit cubes (or 10 ones).

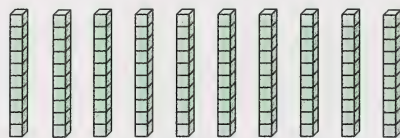


- a. How many ones are there in 2 tens?



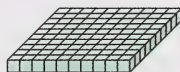
2 tens = \_\_\_\_\_

b. How many ones are there in 10 tens?

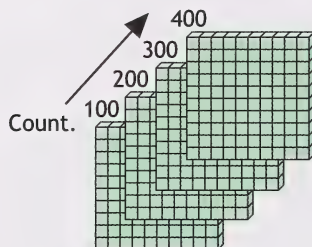


10 tens = \_\_\_\_\_

3. This shows a hundreds flat (or a hundred). In 1 hundred, there are 100 unit cubes (or 100 ones).

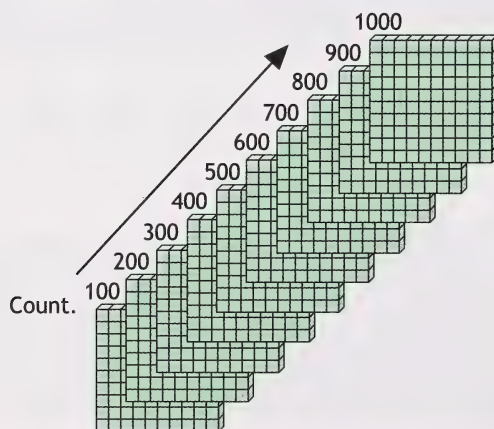


a. How many ones are there in 4 hundreds?



4 hundreds = \_\_\_\_\_

b. How many ones are there in 10 hundreds?



10 hundreds = \_\_\_\_\_



Check your answers in the Appendix.



Find the base ten mat for Day 4 in the Cut-Out Learning Aids section of the Appendix. The mat is printed on two pages. Remove both pages and trim the edges with scissors. Then tape the two pages together. Your base ten mat should look like this.

Hundreds (100)	Tens (10)	Ones (1)

**Base Ten Mat**

Organize your blocks on the base ten mat so that all the unit cubes are in one pile in the Ones column, all the tens rods are in another pile in the Tens column, and all the hundreds flats are in a third pile in the Hundreds column.





4. Without counting, **estimate** how many ones there are altogether in your set of blocks (all three piles).

My estimate: \_\_\_\_\_ ones

Now, count to find the exact number of ones. Start with the unit cubes, then the tens rods, and then the hundreds flats. Each time you count 10 ones, put them together to make a ten. Each time you count 10 tens, put them together to make a hundred.

5. a. What is the exact number of ones in your set of blocks?

\_\_\_\_\_

- b. Write the total number of ones using words instead of numerals.

\_\_\_\_\_

\_\_\_\_\_

Check your answers in the Appendix.

Compare the exact number of ones with your estimate. Was your estimate close to the exact number? Don't worry if it wasn't. You will get a lot of practice throughout Mathematics 4 that will help you improve your estimating skills.



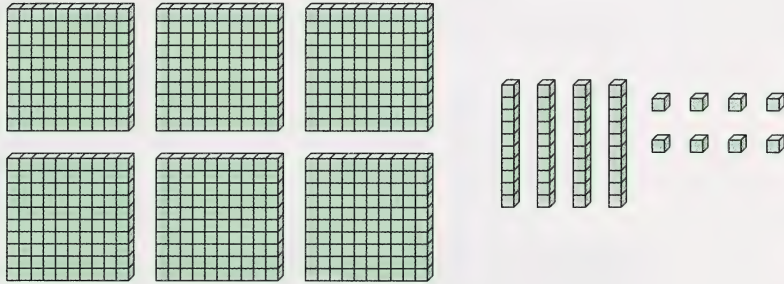
**Remember:** Store your base ten blocks or cutouts in a safe place. You will need them again for future lessons.



## Showing Numbers in Different Ways

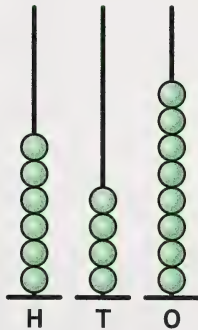
You have seen numbers shown in these different ways:

- **standard form:** 648
- **words:** six hundred forty-eight
- **base ten model**



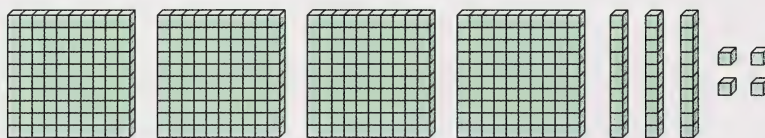
Numbers can also be shown in these ways:

- **expanded form:**  $600 + 40 + 8$
- **expanded form (value):** 6 hundreds + 4 tens + 8 ones
- **abacus model**



6. Write the value for each base ten model in three different ways.

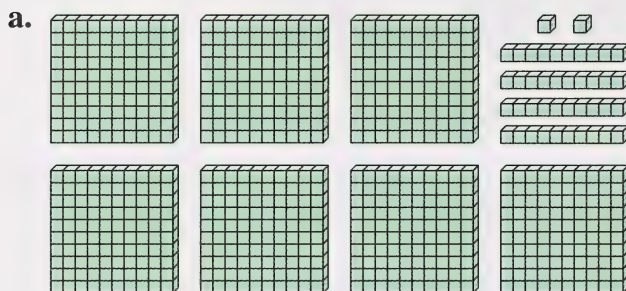
**Example**



• 4 hundreds + 3 tens + 4 ones ← Expanded form (value)

• 400 + 30 + 4 ← Expanded form

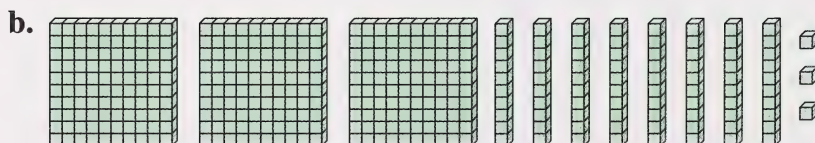
• 434 ← Standard form



• \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_

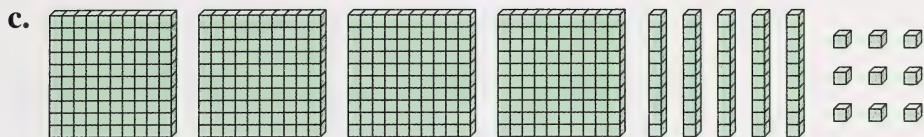


• \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_

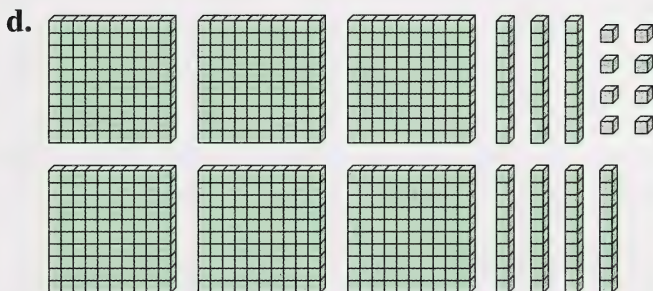




• \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_



• \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_

7. Write each number in standard form.

**Example:** 2 hundreds + 7 tens + 3 ones = 273

a. 6 hundreds + 8 tens + 4 ones = \_\_\_\_\_

b. 8 hundreds + 9 tens + 5 ones = \_\_\_\_\_

c. 4 hundreds + 4 tens + 7 ones = \_\_\_\_\_

d. 2 hundreds + 1 ten = \_\_\_\_\_

e. 3 hundreds + 9 ones = \_\_\_\_\_

8. Write each number in expanded form.

**Example:**  $616 = 600 + 10 + 6$

a.  $787 =$  \_\_\_\_\_

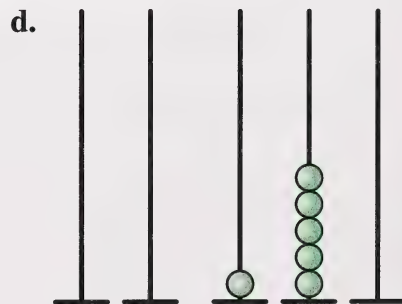
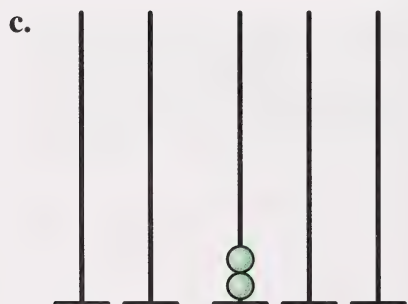
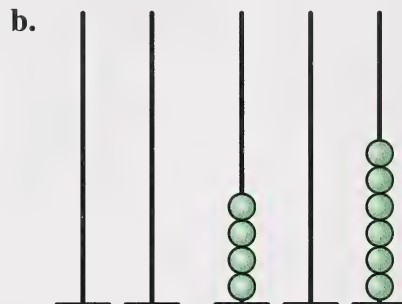
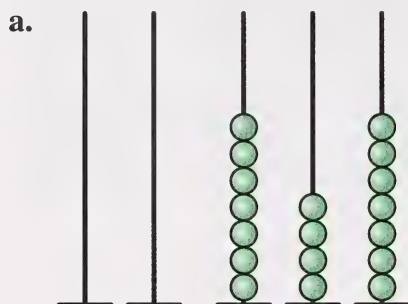
b.  $526 =$  \_\_\_\_\_

c.  $903 =$  \_\_\_\_\_

d.  $144 =$  \_\_\_\_\_

e.  $860 =$  \_\_\_\_\_

9. Write each number in standard form.





10. Use a calculator or mental math to find each number.

**Example:** one hundred less than 895 795

- a. twenty less than 263 \_\_\_\_\_
- b. three hundred ten greater than 640 \_\_\_\_\_
- c. seventy-five less than 400 \_\_\_\_\_
- d. two hundred fifty greater than 350 \_\_\_\_\_
- e. four hundred ten less than 825 \_\_\_\_\_



11. Use a calculator or mental math to find each number. Use **words** to write your answer.

**Example:** 200 greater than 587 seven hundred eighty-seven

- a. 30 less than 249

\_\_\_\_\_

- b. 600 greater than 131

\_\_\_\_\_

- c. 125 less than 675

\_\_\_\_\_

- d. 140 greater than 850

\_\_\_\_\_

- e. 39 greater than 401

\_\_\_\_\_






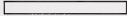
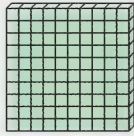

Check your answers in the Appendix.



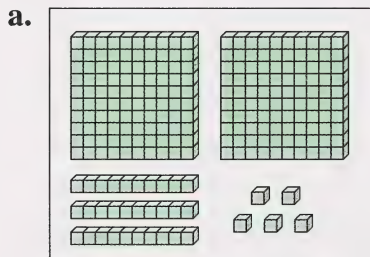
## Drawing Base Ten Models

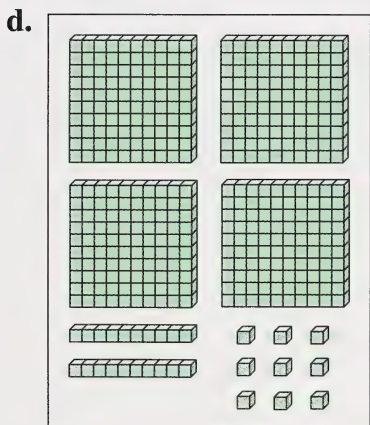
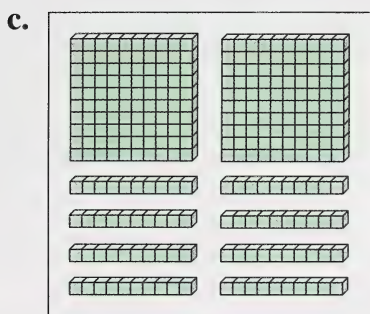
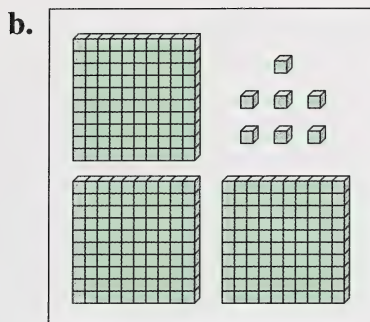


You can use a shortcut to make it easier to draw base ten models. The following chart shows how to draw the shortcuts for base ten models.

Base Ten Model	Shortcut Drawing
	
	
	

12. Use the shortcut method of drawing to redraw each base ten diagram. Then write the standard form of the number.






Check your answers in the Appendix.



13. Turn to page 52 of your textbook. Do question 1 of the Problem Bank. For each part of question 1, decide how many more base ten blocks are needed to make 400. Use the shortcut method to draw your blocks. An example is done for you.

**Problem Bank, Question 1:**

**Example:**

Number You Start With	Base Ten Blocks Needed to Make 400	Number You Need to Make 400
175		225
362		
99		
242		
38		

Check your answers in the Appendix.







## Taking Another Look

The following activity is optional. You may choose to do it or not. You **should** complete the activity if you had difficulty with the questions in Day 4, or if you feel you just need more practice with showing numbers in different ways and making base ten drawings.

If you choose **not** to do the questions at this time, you may wish to return here later to review the concepts on showing numbers in different ways before completing the review activities for Day 9.



### Showing Numbers in Different Ways

Turn to page 53 of your textbook. Do questions 5 to 7 of the Problem Bank. Answer these questions in the spaces provided.

#### Problem Bank, Question 5:

Draw base ten blocks for each set of clues.

a. 379

b. 53 (using 17 blocks)

c. 168 (using 24 blocks)

d. \_\_\_\_\_  
\_\_\_\_\_

**Problem Bank, Question 6:**

**Example:** 23 tens 230 ones or 230

a. 15 tens \_\_\_\_\_

b. 15 hundreds \_\_\_\_\_

c. 15 thousands \_\_\_\_\_

**Problem Bank, Question 7:**

7 9 6

a. greatest \_\_\_\_\_ b. least \_\_\_\_\_

4 1 0 8

a. greatest \_\_\_\_\_ b. least \_\_\_\_\_

5 3 2 6

a. greatest \_\_\_\_\_ b. least \_\_\_\_\_



Check your answers in the Appendix.

Turn to Assignment Booklet 2A, and complete the activities for Day 4.



## Modelling Larger Numbers

Dinosaurs were large reptiles that lived over 65 million years ago. The largest dinosaurs, the sauropods, were over 42 m in length and up to 16.5 m tall. The Supersaurus, one of the largest dinosaurs, had a neck that was 12 m long!

Can you imagine trying to build a model the same size as a real Supersaurus? You'd need a very large building to put it in, wouldn't you? Often the dinosaurs you see in museums are **scale models**, which means the models are much smaller than the real animals were.



Just as models are used to understand what large dinosaurs were like, you can also use models to understand what very large numbers are like. In Day 5, you will learn how to model large numbers using base ten blocks.

To find out more about dinosaurs of all sizes, you may want to visit this website:

<http://www.ZoomDinosaurs.com>



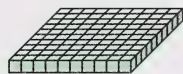




## Introducing Thousands



Use your base ten blocks to answer question 1.



Hundreds flat



Tens rod



Unit cube

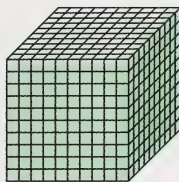
1. a. How many unit cubes make a tens rod? \_\_\_\_\_
- b. A tens rod is \_\_\_\_\_ times as big as a unit cube.
- c. How many rods make a hundreds flat? \_\_\_\_\_
- d. A hundreds flat is \_\_\_\_\_ times as big as a tens rod.
- e. Therefore, the next bigger block in the base ten set should be \_\_\_\_\_ times as big as a hundreds flat.



Check your answers in the Appendix.



The next block in the base ten set is called a **thousands cube**. To build the thousands cube using your base ten blocks, you will need all ten hundreds flats.



Thousands cube

If you have an actual set of base ten blocks, follow these directions before going on to question 2.

**Step 1:** Find all ten hundreds flats. Arrange the flats into a cube by stacking them.

**Step 2:** Does your thousands cube look like the drawing above? If so, go on to question 2.

If you are using base ten cutouts, follow these directions before going on to question 2.

**Step 1:** Find the six hundreds flats you cut out for Day 4. Turn to Day 5 and cut out the four remaining hundreds flats.

**Step 2:** Arrange all ten hundreds flats into a cube by “stacking” the paper layers. Overlap the flats so that you can see only the front and side edges of the bottom nine flats.

**Step 3:** Does your thousands cube look like the drawing above? If so, go on to question 2.

2. a. How many unit cubes are there in a thousands cube? \_\_\_\_\_
- b. How many hundreds flats are there in a thousands cube? \_\_\_\_\_
- c. How many tens rods are there in a thousands cube? \_\_\_\_\_
- d. Explain how you answered question 2.c.

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Check your answers in the Appendix.

For the following activity you will need to cut out the thousand cube blocks found in Day 5 of the Cut-Out Learning Aids section of the Appendix. There are ten thousands cubes to cut out.

3. Turn to page 38 of your textbook. Do the activity in Representing Large Numbers using the cut-out base ten blocks. Have your home instructor check each base ten model. Also, ask your home instructor to listen as you read each number aloud. Then, in the spaces provided

- write each number as a numeral
- write each number in words

**Remember:** You may leave a space between the thousands and the hundreds if you wish. For example, you can write 5649 **or** 5 649.

- 1 thousand, 3 hundreds, 6 tens, 7 ones

numeral: \_\_\_\_\_

words: \_\_\_\_\_

\_\_\_\_\_



- 2 thousands, 5 tens, 5 ones

numeral: \_\_\_\_\_

words: \_\_\_\_\_

- 1 thousand, 8 hundreds

numeral: \_\_\_\_\_

words: \_\_\_\_\_

- 3 thousands, 2 hundreds, 9 ones

numeral: \_\_\_\_\_

words: \_\_\_\_\_



Check your answers in the Appendix.

4. Have you noticed that when you model numbers using base ten blocks, not all types of blocks are used for all numbers?

**Example:** 2 thousands, 6 tens, 3 ones

- a. To model this number, you would use thousands cubes, tens rods, and unit cubes. You would not use any \_\_\_\_\_.
- b. To show that there are no hundreds in the number, you write a \_\_\_\_\_ in the hundreds place.

Thousands	Hundreds	Tens	Ones
2	0	6	3

- c. How many zeros would you use to write the numeral one thousand eighty? Explain your answer by telling about which base ten blocks you would use and which blocks you would not use when you build a model of the number.

---

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---



Check your answers in the Appendix.

### Making a Thousands Cube 3-D Model



For this activity, you will build a thousands cube model from two cut-out pieces of paper. Turn to Day 5 of the Cut-Out Learning Aids section in the Appendix. Follow the instructions for making the model. You will need scissors and tape (or glue) to complete this project.

Compare your thousands cube 3-D model to one of the flat, cut-out thousands cubes you used in question 3. Can you tell that they both represent a large cube made up of 1000 smaller cubes?

5. Which model represents 1000 more clearly to you? Tell why.

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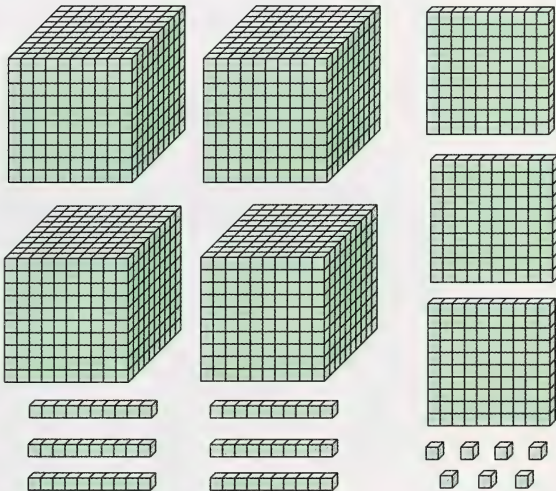
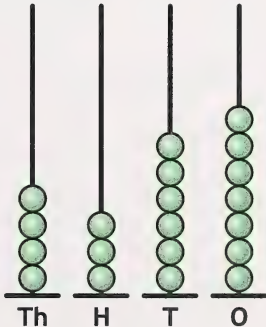
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Check your answers in the Appendix.

## Showing Numbers in Different Ways

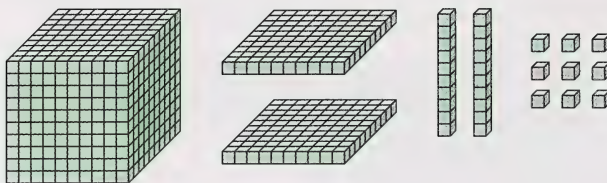
In Day 4 you used different ways to show small numbers. Numbers in the thousands can also be shown in the same ways.

Method	Number
Standard Form	4367
Words	four thousand three hundred sixty-seven
Expanded Form	$4000 + 300 + 60 + 7$
Expanded Form (Value)	4 thousands + 3 hundreds + 6 tens + 7 ones
Base Ten Model	
Abacus Model	



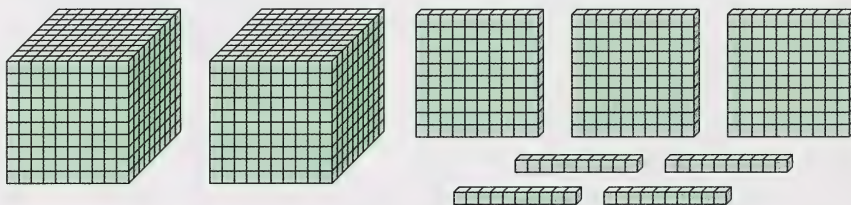
6. Write the value for each base ten model in three different ways.

**Example**



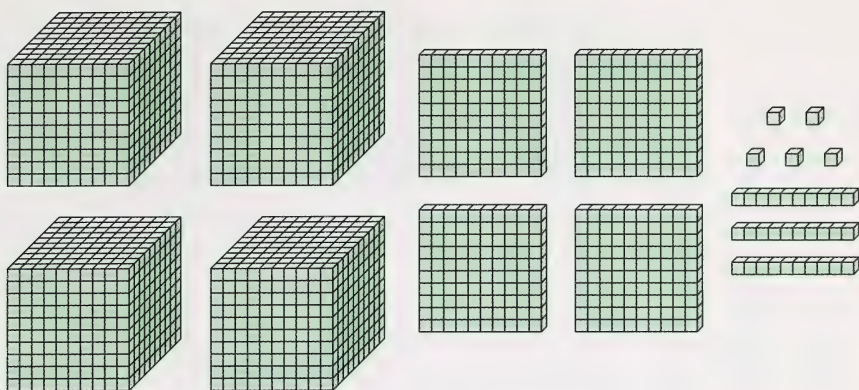
- 1 thousands + 2 hundreds + 2 tens + 9 ones
- 1000 + 200 + 20 + 9
- 1229

a.



- \_\_\_\_\_ thousands + \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones
- \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_
- \_\_\_\_\_

b.

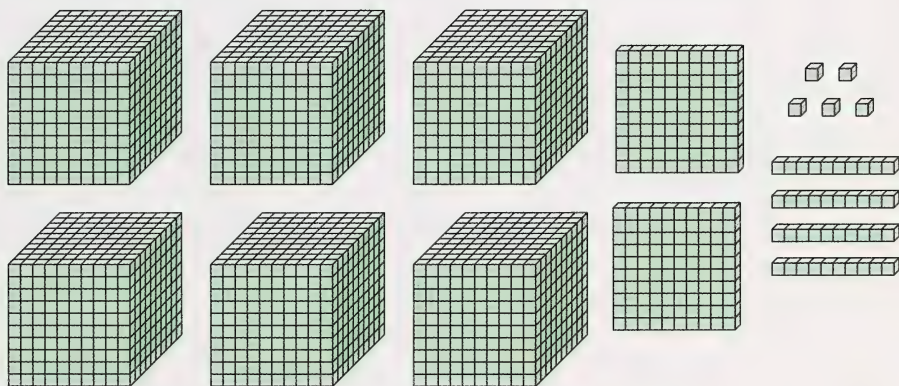


• \_\_\_\_\_ thousands + \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_

c.

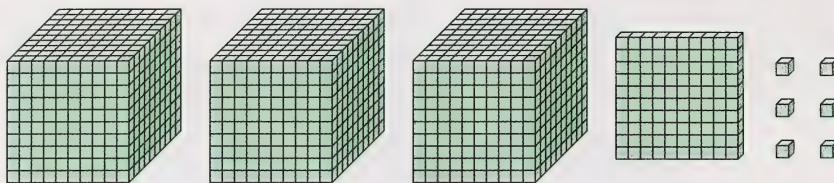


• \_\_\_\_\_ thousands + \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_

d.



• \_\_\_\_\_ thousands + \_\_\_\_\_ hundreds + \_\_\_\_\_ tens + \_\_\_\_\_ ones

• \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

• \_\_\_\_\_

7. Write the value of each underlined digit.

**Example:** 3528 500

a. 4171 \_\_\_\_\_

b. 6545 \_\_\_\_\_

c. 7346 \_\_\_\_\_

d. 3024 \_\_\_\_\_

e. 2819 \_\_\_\_\_

8. Write each of the following in expanded form.

**Example:** 5172 5000 + 100 + 70 + 2

a. 2035 \_\_\_\_\_

b. 6924 \_\_\_\_\_

c. 1003 \_\_\_\_\_

d. 5555 \_\_\_\_\_

e. 9957 \_\_\_\_\_

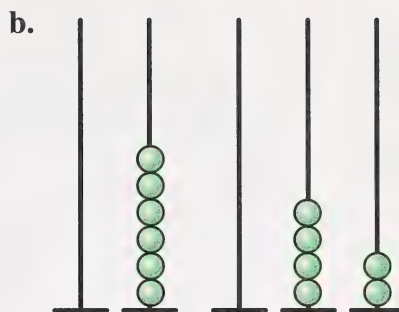
f. 3000 \_\_\_\_\_



9. Write each number in standard form.



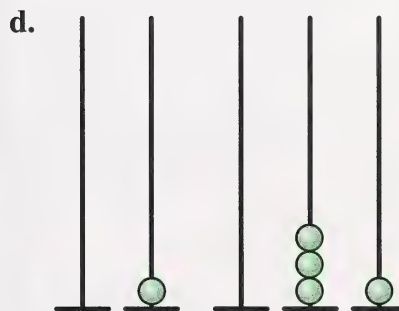
\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

10. Use mental math or a calculator to find each number.

**Example:** 3000 greater than 1046 4046

a. 200 greater than 2305 \_\_\_\_\_

b. 4500 less than 5000 \_\_\_\_\_

c. 110 less than 1140 \_\_\_\_\_



d. 500 greater than 3412 \_\_\_\_\_

e. 1200 greater than 6599 \_\_\_\_\_

Check your answers in the Appendix.

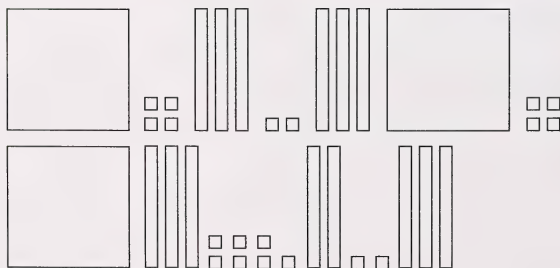


## Regrouping Using the Place-Value Chart



Lucie has this set of base ten blocks. What number does it stand for?

You can use your base ten models to follow each step.



In order to decide what number can be made from Lucie's set of base ten blocks, first count all the ones, all the tens, and all the hundreds. Then record each number on a place-value chart like the one shown. **Note:** **H** means "hundreds," **T** means "tens," and **O** means "ones."

H	T	O
3	14	19

Lucie has  
3 hundreds flats,  
14 tens rods, and  
19 unit cubes in  
her set of  
blocks.

Begin by regrouping the ones. Regrouping the **ones** gives **1 ten** and **9 ones**. Add the **1 ten** to the Tens column, making **15 tens** altogether.

H	T	O
3	14	19
3	15	9

19 ones = 1 ten + 9 ones  
14 tens + 1 ten = 15 tens

Next, regroup the **tens**. Regrouping the tens gives **1 hundred** and **5 tens**. Add the **1 hundred** to the Hundreds column, making **4 hundreds**.

H	T	O
3	14	19
3	15	9
4	5	9

15 tens = 1 hundred + 5 tens  
3 hundreds + 1 hundred = 4 hundreds

No more groups of ten can be made in any column, so no more regrouping is possible.

11. What number does Lucie's set of base ten blocks stand for?



Check your answers in the Appendix.





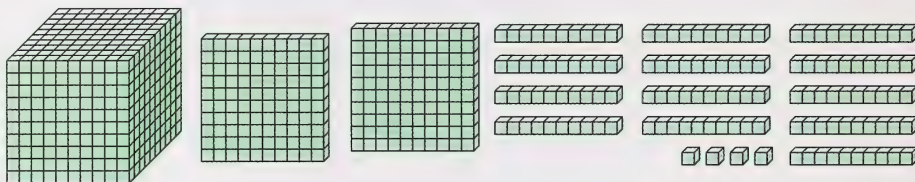
### Note to the Home Instructor

If the student is having difficulty understanding the regrouping in this activity, further use of manipulatives is recommended. Use the base ten blocks and allow the student to create groups of ten to show the regrouping process of ones to tens and tens to hundreds as you work through the following exercises. Use the base ten mat for Day 5 found in the Cut-Out Learning Aids section of the Appendix. You will need to use the 3-D model of the thousands cube the student made.



12. Write the number that each set of base ten blocks represents. Use your base ten blocks and the base ten mat for Day 5 (found in the Cut-Out Learning Aids section of the Appendix) to help you sort and regroup each set of blocks. **Note:** Th means “thousands.”

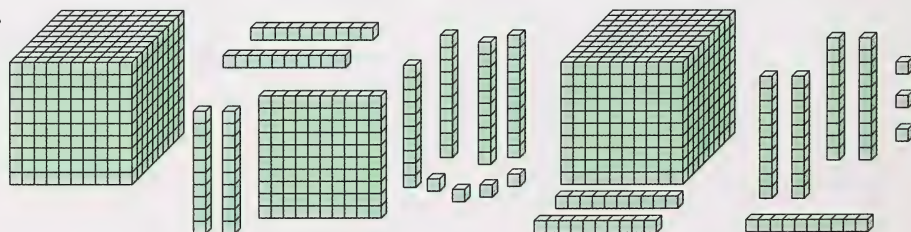
a.



Th	H	T	O

Number \_\_\_\_\_

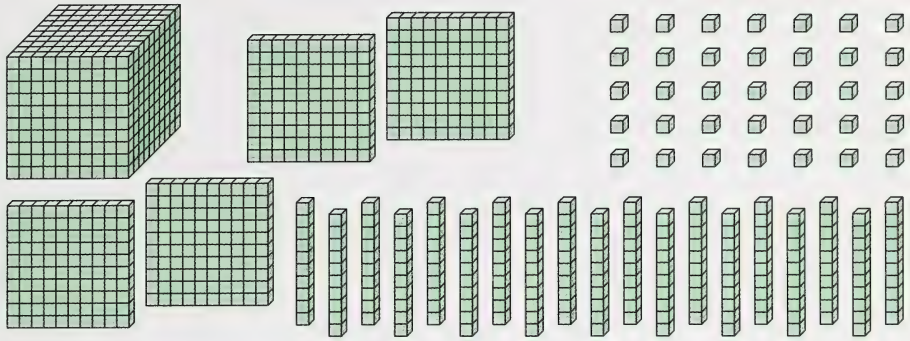
b.



Th	H	T	O

Number \_\_\_\_\_

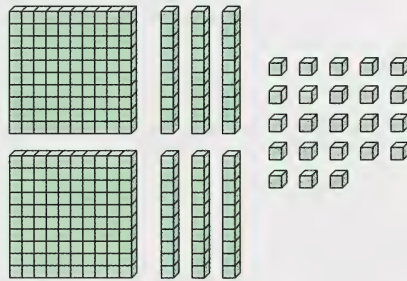
c.



Th	H	T	O

Number \_\_\_\_\_

13. Suppose you had these base ten blocks on your desk.



- a. Could you use these blocks to make a model to show 274? Use a diagram to explain your answer.

- b. Could you use these blocks to make a model to show 196? Use a diagram to explain your answer.

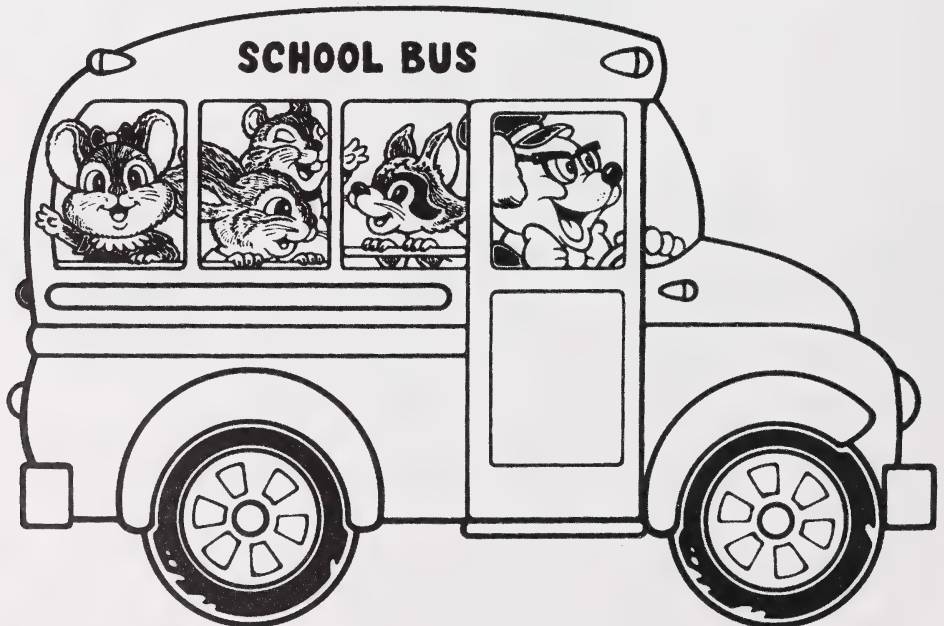


Check your answers in the Appendix.

# Just For Fun



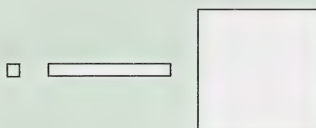
When you feel like you need a break from your work, colour this picture.



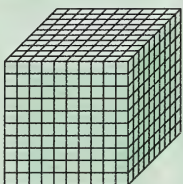
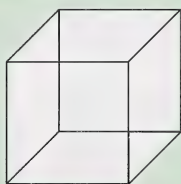


## Drawing Base Ten Blocks

In Day 4 you practised drawing unit cubes, tens rods, and hundreds flats using the short-cut method. All of these blocks are drawn as flat figures.



Today, you will be drawing the thousands cube. The thousands cube is a large cube shape made up of 1000 unit cubes. In the short-cut method, you draw a large cube or box shape.

Base Ten Model	Short-cut Drawing
	

If you have trouble drawing this cube shape, try this method:

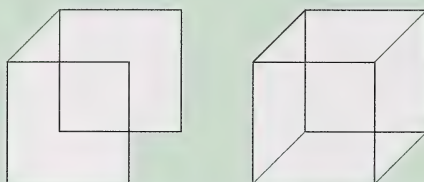
**Step 1:** Draw a square.



**Step 2:** Draw another square that overlaps the first square. (You should see a smaller square in the middle.)

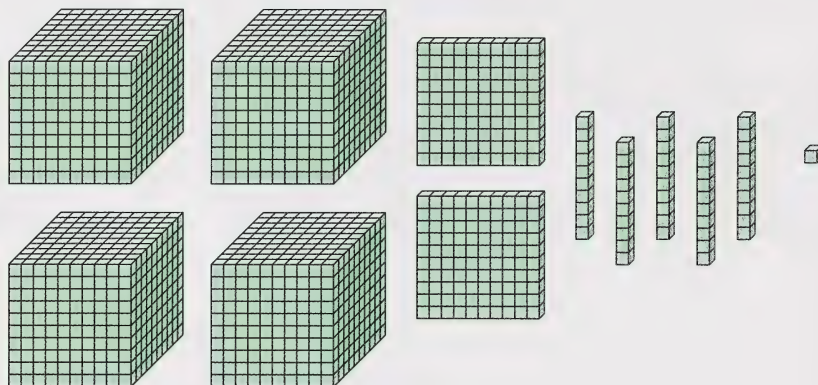


**Step 3: Connect the corners.**



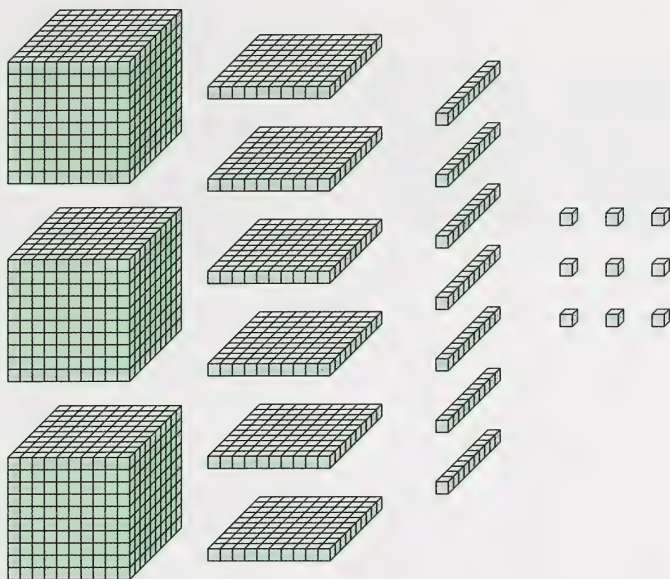
- 14.** Use the short-cut drawing method to redraw each set of base ten drawings in the space provided. Tell what number each set of drawings stands for.

**a.**



Number \_\_\_\_\_

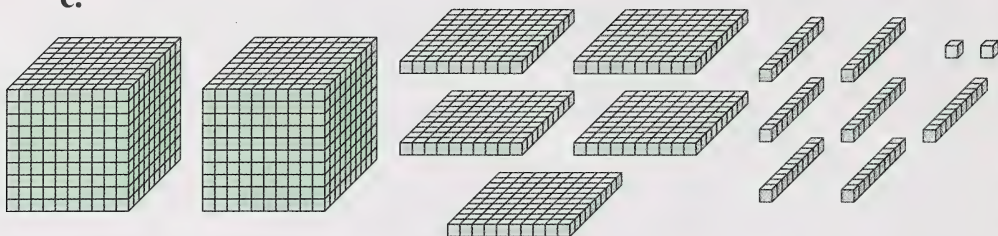
b.



Number \_\_\_\_\_



c.



Number \_\_\_\_\_

Check your answers in the Appendix.

15. Turn to page 52 of your textbook. Do question 2 of the Problem Bank. Answer each part in the space provided. **Note:** More than one answer may be possible.



**Problem Bank, Question 2:**

**a.**

A number that fits the clues is \_\_\_\_\_.

Base Ten Blocks:

**Problem Bank, Question 2:**

**b.**

A number that fits the clues is \_\_\_\_\_.

Base Ten Blocks:

**Problem Bank, Question 2:**

**c.**

A number that fits the clues is \_\_\_\_\_.

Base Ten Blocks:

**Problem Bank, Question 2:**

**d.**

A number that fits the clues is \_\_\_\_\_.

Base Ten Blocks:

Check your answers in the Appendix.

Ask your home instructor to check your base ten models.

Turn to Assignment Booklet 2A, and complete the activities for Day 5.





## Place Value—Whole Numbers



Mike and Cheng were doing their math homework at Mike's house one day after school.

"There, I'm done!" said Cheng with a satisfied smile. "All 25 questions. How about you, Mike? Are you done yet?"

"Yeah, I'm finished," replied Mike without looking up, "but I'm checking over my answers. You should check yours over too, Cheng."

"What for? These were easy. All you had to do was add a few numbers together," said Cheng.

"Did you check to see if you had the numbers lined up carefully so that each digit was in the right place-value column?"

“The right what?” Cheng asked. Mike just shook his head. He knew Cheng didn’t always listen to what the teacher was saying.

Suddenly, Cheng let out a groan. “Oh no! You don’t suppose I got them all wrong, do you? Hey, Mike, I have an idea. Let’s compare our answers just to make sure we both did the questions correctly.”

“All right,” said Mike,” but no copying my answers.”

“Don’t worry, Mike,” replied Cheng. “I’m a whiz at this math stuff! Here, I’ll go first. First question:  $27 + 164 + 3$ . My answer is 734. What’s yours?”

“194,” replied Mike.

“Looks like one of us made a mistake,” said Cheng. “Let’s compare our answers to see who is wrong.”

Cheng and Mike compared their answers.

Cheng’s Answer     Mike’s Answer

$$\begin{array}{r} 27 \\ 164 \\ + 3 \\ \hline 734 \end{array}$$

$$\begin{array}{r} 27 \\ 164 \\ + 3 \\ \hline 194 \end{array}$$

“I see the problem already, Cheng,” said Mike. “You’ve lined up your numbers wrong. Looks like *you* need a lesson in place value. Come on, let’s go down to the basement. We’ve got a chalkboard down there. We can practise writing numbers in the correct place-value columns.”

Were you able to spot Cheng's mistake?

**Cheng forgot that the value of a numeral changes depending on what place-value column it's in.**

For example, in the question the boys were checking, Cheng put 27 in the wrong place-value columns.

He put the 2 in the **Hundreds** column and 7 in the **Tens** column.

H	T	O
2	7	

270

He should have put the 2 in the **Tens** column and the 7 in the **Ones** column.

H	T	O
	2	7

27

In today's lesson you will learn more about place value.

- You will use a four-column place-value chart to show several ways of rewriting whole numbers.
- You will also be introduced to the ten-thousands place-value column.



## Representing Numbers in Different Ways

Jared and Jason each have the same amount of money. Both boys have only loonies, dimes, and pennies. Jared has 5 coins totalling \$2.30. Jason also has \$2.30, but he has 14 coins.

One way to show how many coins each boy has is to use a diagram.

### Jared



### Jason



A chart can also be used to show how many coins Jared and Jason have.

	Number of \$1 Coins	Number of 10¢ Coins	Number of 1¢ Coins	Total Number of Coins
Jared	2	3	0	5
Jason	2	2	10	14

1. Show **five** more ways of making \$2.30 using only loonies, dimes, and pennies. In each case, do not use more than 100 coins.

Number of \$1 Coins	Number of 10¢ Coins	Number of 1¢ Coins	Total Number of Coins

2. Use your place-value chart to show 1530 in **five** other ways using **only** thousands, hundreds, and tens. You may use your base ten blocks if you need help. An example has been done for you.

**Example:**

Thousands 1	Hundreds 5	Tens 3	Ones 0
1	4	13	0
			0
			0
			0
			0
			0

Check your answers in the Appendix.



## Introducing Ten Thousands

3. Look at the following place-value chart.

?	?	Tens	?
9	6	1	2

- a. What place-value heading goes above the 2?

\_\_\_\_\_

- b. What place-value heading goes above the 6?

\_\_\_\_\_

- c. What place-value heading goes above the the 9?

\_\_\_\_\_

**Remember:** The value of each place-value column is 10 times greater than the one on its right.

4. Complete each statement using the word **thousands**, **hundreds**, **tens**, or **ones**.

- a. \_\_\_\_\_ are 10 times greater than ones.

- b. Hundreds are 10 times greater than \_\_\_\_\_.

- c. \_\_\_\_\_ are 10 times greater than hundreds.

Check your answers in the Appendix.





5. Suppose another column is added to the left of the Thousands column.

?	Thousands	Hundreds	Tens	Ones
1	3	6	1	2

- a. How much greater do you think this place will be than thousands?

\_\_\_\_\_ times greater

- b. What do you think this place-value column is called?

\_\_\_\_\_

Check your answers in the Appendix.

The number shown in the place-value chart in question 5 is written this way:

13 612

**Remember:** When writing large numbers, a space is always left between the thousands and the hundreds. No comma is used.

To show the number 13 612 using **words**, you would write:

thirteen thousand six hundred twelve

Notice that you do not use the word "and" when writing or reading a large number.

Ask your home instructor to listen as you read these numbers aloud:

•6581

•9943

•10 120

6. Write the numeral for each number. Be sure to leave a space between the thousands and the hundreds.



**Remember:** Each place-value column must have a placeholder. Use a zero if no other number is needed.

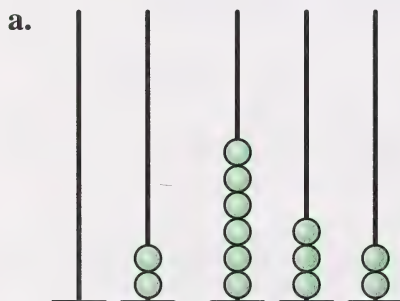
**Example:** ten thousand two 10 002

- a. three thousand sixty-five \_\_\_\_\_
- b. seven thousand nine hundred sixteen \_\_\_\_\_
- c. ten thousand five hundred eight \_\_\_\_\_
- d. two thousand two hundred two \_\_\_\_\_
- e. four thousand fifty \_\_\_\_\_

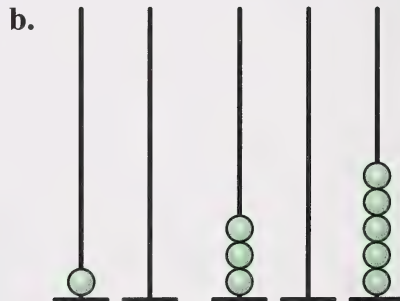
Check your answers in the Appendix.



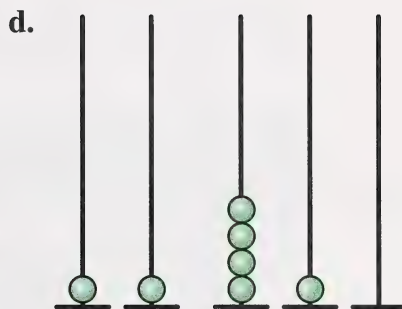
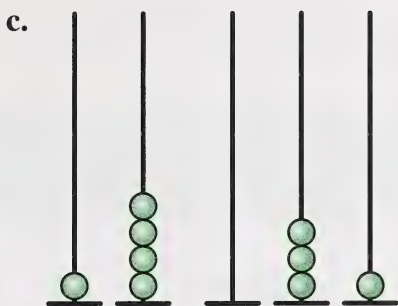
7. Write each number in standard form.



\_\_\_\_\_



\_\_\_\_\_



Check your answers in the Appendix.

## What Does Ten Thousand Look Like?

You have already learned that the value of each place-value column is 10 times greater than the one on its right.

Ten Thousands	Thousands	Hundreds	Tens	Ones
------------------	-----------	----------	------	------

1 ten = 10 ones

1 hundred = 10 tens

1 thousand = 10 hundreds

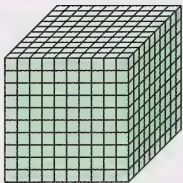
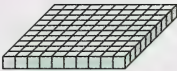


1 ten thousand = 10 thousands

How can you show 10 thousands using base ten blocks?

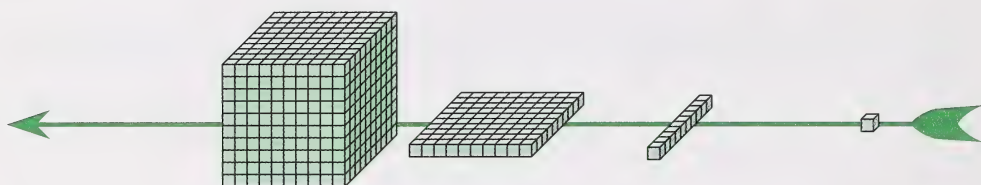
Find the ten cutouts of the thousands cube from Day 5. Try putting them together to form a ten-thousands block. Do it now and note the shape of the block when you are finished.



To help you determine if the shape you created is correct, look at the following table.

Ten Thousands	Thousands	Hundreds	Tens	Ones
?				

8. a. What pattern do you see in the shapes as you move across the table from **right** to **left**? (**Hint:** Notice that the cube shape occurs more than once.)



?	Cube	Flat	Rod	Cube
---	------	------	-----	------

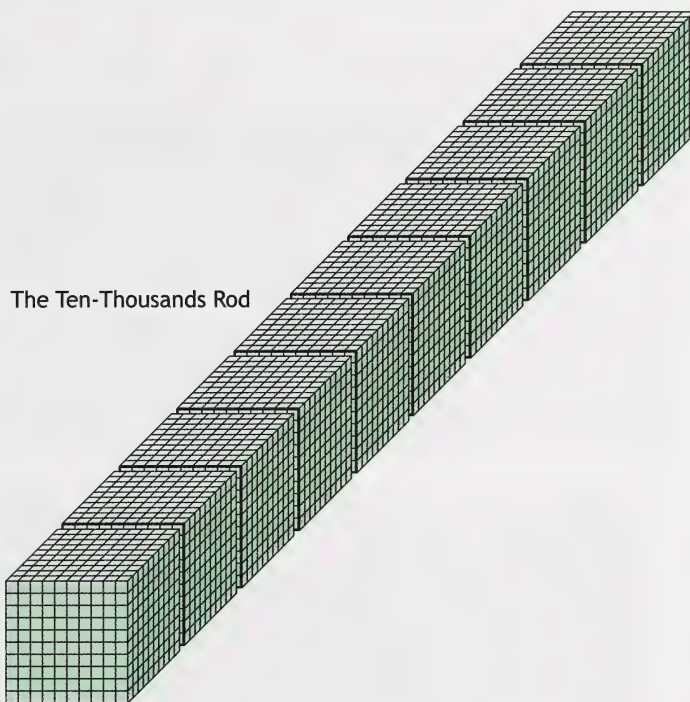
- b. What shape do you predict the ten-thousands block will have?

Check your answers in the Appendix.





9. Find all ten of the thousands cube cutouts. Arrange the cubes into a rod-shaped block. This block is called a **ten-thousands rod**.



The Ten-Thousands Rod

- a. How many thousands cubes are in a ten-thousands rod?

---

- b. How many hundreds flats are in a thousands cube?

---

- c. How many hundreds flats are in a ten-thousands rod?

---

- d. How many unit cubes are in a ten-thousands rod?

---



Check your answers in the Appendix.


## Basic Number Facts Practice



It's time to practise your addition and subtraction number fact skills again.



Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

Basic Number Facts Practice		
Addition Number Facts		
	Number Completed in 2 Minutes _____	
	Number Correct in 2 Minutes _____	
	Subtraction Number Facts	
	Number Completed in 2 Minutes _____	
	Number Correct in 2 Minutes _____	
Record your score on the Number Facts Progress Chart.		



**10. Addition Number Facts**

**Timed Exercise: 2 minutes**

$$\begin{array}{r} 7 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 6 \\ \hline \end{array}$$

$7 + 7 =$

$9 + 6 =$

$9 + 9 =$

$6 + 6 =$

$8 + 5 =$

$$\begin{array}{r} 6 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 4 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 6 \\ \hline \end{array}$$

$8 + 6 =$

$9 + 7 =$

$7 + 4 =$

$9 + 5 =$

$7 + 7 =$

$$\begin{array}{r} 7 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 4 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 9 \\ \hline \end{array}$$



Check your answers in the Appendix.



**11. Subtraction Number Facts**  
**Timed Exercise: 2 minutes**

$$\begin{array}{r} 14 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - 6 \\ \hline \end{array}$$

$12 - 7 =$

$18 - 9 =$

$14 - 8 =$

$13 - 9 =$

$17 - 8 =$

$$\begin{array}{r} 13 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 9 \\ \hline \end{array}$$

$13 - 5 =$

$11 - 7 =$

$15 - 6 =$

$12 - 5 =$

$14 - 5 =$

$$\begin{array}{r} 15 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 9 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - 9 \\ \hline \end{array}$$

Check your answers in the Appendix.

Turn to Assignment Booklet 2A, and complete the activities for Day 6.



## Comparing Whole Numbers



Marcie and Jan were talking about their card collections.

“I have 12 new cards,” Marcie announced. “That gives me 218 cards altogether. How about you, Jan?”

“I had 198 cards,” replied Jan. “Then I bought 18 cards. So, now I have just as many as you.”

“Not quite, Jan. If you add 198 and 18, you get 216. That’s two less than 218. I have two more cards than you.”

In the story you just read, Marcie and Jan are comparing the number of cards in their collections. Have you ever talked with a friend about who had more of something, or who could jump farther, run faster, or reach higher? Often, when you “talk numbers,” you end up comparing numbers. This helps make sense of the numbers and sometimes helps to solve a problem.

Suppose you want to sell a pair of skis that are too small for you. One day at school you notice a sign on the student notice board.

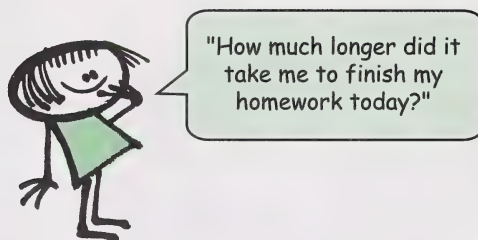
When you go home and measure your skis, you find they are 158 cm long. By **comparing the numbers**, you can easily see that 158 is between 155 and 165, so perhaps Janice might want to buy your skis.



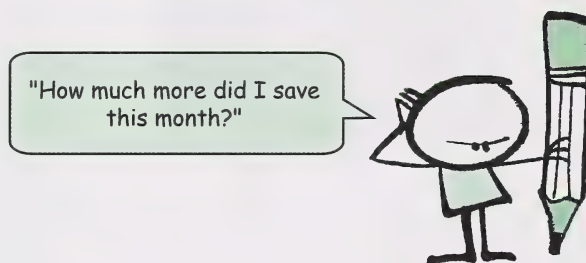


You compare numbers all the time:

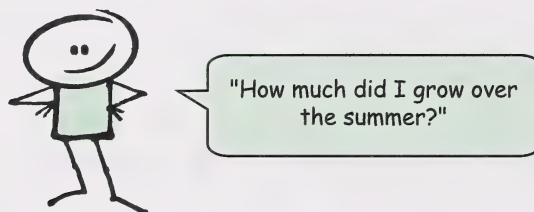
- You compare **times**.



- You compare **money amounts**.



- You compare **heights**.



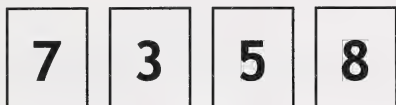
Can you think of a time when you had to compare two or more numbers in order to solve an everyday problem? Spend a few minutes with your home instructor and talk about ways you have used numbers to compare.

## Value of Digits in a Number



Before you begin this activity, turn to Day 7 in the Cut-Out Learning Aids section of the Appendix. Cut out the ten number cards and the ten place-value cards.

1. Take out these number cards:



(Set the other cards aside. You will need all 20 cards later today.)

- a. Using the four cards, make the least (smallest) four-**digit** number you can. Write this number. \_\_\_\_\_
- b. Now make the greatest 4-digit number you can. \_\_\_\_\_
- c. Now make **five** more four-digit numbers from the cards. Write them in order from least to greatest.

\_\_\_\_\_ least

\_\_\_\_\_ greatest

Check your answers in the Appendix.

2. How were you able to put the numbers in question 1.c. in order from least to greatest? Explain your thinking.

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Check your answers in the Appendix.



Did you notice that the value of a digit in a number changes depending on where in the number (in which place-value column) it appears?

For example, the 7 in 7358 has a different value than the 7 in 3875.

- In 7358, the value of 7 is **7000** because the 7 represents **7 thousands** in the thousands column.
- In 3875, the value of 7 is **70** because the 7 represents **7 tens** in the tens column.

3. What is the value of 8 in each number? Write your answer as 8, 80, 800, or 8000.

- a. 680 \_\_\_\_\_      b. 8469 \_\_\_\_\_      c. 3178 \_\_\_\_\_  
d. 1837 \_\_\_\_\_      e. 9585 \_\_\_\_\_      f. 825 \_\_\_\_\_

4. Write the number for each of the following.

**Remember:** Each place-value column must be represented by a number. If no number is given, use zero.

- a. 2 thousands, 7 hundreds, 9 tens, 8 ones \_\_\_\_\_  
b. 3 thousands, 1 hundred, 5 ones \_\_\_\_\_  
c. 1 ten-thousand, 5 tens, 2 ones \_\_\_\_\_  
d. 6 thousands, 7 ones \_\_\_\_\_  
e. one thousand two hundred forty-three \_\_\_\_\_  
f. three thousand fifty-seven \_\_\_\_\_  
g. two thousand eleven \_\_\_\_\_





h. six thousand six hundred six \_\_\_\_\_

i. eight thousand one hundred eighty-one \_\_\_\_\_



Check your answers in the Appendix.

## Comparing Numbers

Look at these three numbers:

**328      238      283**

How can you show which of these numbers is the greatest and which is the least (or smallest)?



One way is to use base ten blocks to make a model of each number and then compare the hundreds, tens, and ones. First, use your base ten blocks to make a model of each number. Use the base ten mat from Day 4.

	Hundreds (100)	Tens (10)	Ones (1)
328			
238			
283			

To compare the three numbers, you look at one place-value column at a time. Begin on the left side with the hundreds.

5. a. Which number has more hundreds than the others? \_\_\_\_\_
- b. Can you tell which number is the greatest? \_\_\_\_\_ Write the number. \_\_\_\_\_
- c. Can you tell by looking at the hundreds which number is the next greatest after 328? \_\_\_\_\_ Tell why or why not.

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Check your answers in the Appendix.

To find the next greatest number, you need to move one place-value column to the right and compare the tens.

6. a. Of the two numbers, 238 and 283, which has more tens? \_\_\_\_\_
- b. Can you tell by looking at the tens which number is the next greatest after 328? \_\_\_\_\_ Write the number. \_\_\_\_\_
- c. Which number is the least (or smallest)? \_\_\_\_\_

7. Write the three numbers in order from greatest to least.

\_\_\_\_\_ greatest

\_\_\_\_\_

\_\_\_\_\_ least



Check your answers in the Appendix.

Another way to compare numbers is to use tally marks on a place-value chart. (A place-value chart is also called an **HTO chart**.)

### Example

Look at the following three numbers. Compare the numbers using an HTO chart. Then write the numbers in order from greatest to least.

**432      426      435**

Instead of base ten blocks, use tally marks to show how many hundreds, tens, and ones are in each number.

	H	T	O
432			
426			
435			

To compare the numbers, look at the hundreds, then the tens, and then the ones.

8. a. Can you tell which number is greatest or least by looking at the hundreds? Tell why.

\_\_\_\_\_

- b. What can you tell by looking at the tens column?

\_\_\_\_\_

- c. Put an **L** beside the number on the HTO chart that is least.

- d. Can you tell which number is greatest by looking at the tens column?

\_\_\_\_\_

- e. Look at the ones column. Which number, 432 or 435, is greater?

**Remember:** You already know 426 is the least number. \_\_\_\_\_



9. Write the three numbers in order from greatest to least.



\_\_\_\_\_

greatest

\_\_\_\_\_

least

Check your answers in the Appendix.

Now, try comparing three larger numbers.

9780      9830      9760

How can you tell which of these numbers is the greatest and which is the least? Instead of using base ten blocks, write the three numbers on a place-value chart. Then look at the value of the digits by starting **at the left**.

Th	H	T	O
9	7	8	0
9	8	3	0
9	7	6	0

Starting at the left, you can see that all three numbers have the same number of thousands. So, it is necessary to look at the next column (the hundreds) to determine which of the numbers is the greatest. By comparing the hundreds, you can see that 9830 has the most hundreds. Therefore, 9830 is the greatest number.

Since both remaining numbers each have 7 hundreds, you must look at the tens column to determine which of those two is greater. The number 9780 is greater than 9760 because it has more tens. Therefore, 9760 is the least (smallest) number.



**Remember:** Two numbers with the same number of digits can be compared by looking at the value of their digits starting on the left.

10. Compare each pair of numbers. Use  $>$  (greater than) or  $<$  (less than).

**Example:** 7875  $>$  7857

a. 5483 \_\_\_\_\_ 5438

b. 6686 \_\_\_\_\_ 6866

c. 4363 \_\_\_\_\_ 4336

d. 2102 \_\_\_\_\_ 2120

e. 2929 \_\_\_\_\_ 9229

f. 9769 \_\_\_\_\_ 9697

11. Use the following numbers to answer questions 11.a. and 11.b.

**491, 941, 419, 194, 149, 914**

a. List all of the numbers that are greater than 484.

\_\_\_\_\_

b. List all of the numbers that are less than 694.

\_\_\_\_\_

12. Rewrite each set of numbers in order from **least** to **greatest**. If you need to, write the numbers on a place value chart.

a. 8232, 8332, 8233, 8222

least

greatest

b. 3234, 2243, 3423, 2224

least

greatest

c. 6556, 5656, 5565, 6566

least

greatest

Check your answers in the Appendix.



# Just For Fun



Play “The Place-Value Game.”

**Number of players:** 2

**Materials:** Locate the place-value cards and the number cards for Day 7 that you cut out earlier. This game can also be played using a regular deck of cards. Remove the 12 face cards from the deck first. Use the tens as zeros.

**How to play:** Find a partner. Turn to pages 42 and 43 of your textbook to see how the game is played. The object of the game is to make a five-digit number that is greater than your opponent’s number. Play the game several times until you have developed a strategy for winning. To make the game different, you may want to change the goal to making a smaller number than your opponent’s number.

## Note to the Home Instructor

If the student seems to be having difficulty comparing two five-digit numbers, try playing the game using only four place-value columns (thousands, hundreds, tens, and ones).







## Taking Another Look

The following activities are optional. You may choose to do them or not. You **should** complete the activities if you had difficulty with the questions in Days 5, 6, or 7, or if you feel you just need more practice with place value and comparing numbers.

If you choose **not** to do the questions at this time, you may wish to return here later to review the concepts on place value and comparing numbers before completing the review activities for Day 9.

1. Write each of the following numbers in standard form. Remember, when no number is shown for a place-value column, 0 is used as a place holder.

**Example:**  $2000 + 80 + 6 = \underline{2086}$

a.  $3000 + 200 + 40 + 7 = \underline{\hspace{2cm}}$

b.  $5000 + 20 + 9 = \underline{\hspace{2cm}}$

c.  $7000 + 400 + 50 + 6 = \underline{\hspace{2cm}}$

d.  $2000 + 900 + 3 = \underline{\hspace{2cm}}$

e.  $1000 + 800 + 70 = \underline{\hspace{2cm}}$

2. Complete each of the following arithmetic sentences. Place the correct number in each blank.

a.  $3000 + \underline{\hspace{1cm}} + 40 + 3 = 3343$

b.  $6862 = 6000 + 800 + \underline{\hspace{1cm}} + 2$

c.  $7000 + 600 + \underline{\hspace{1cm}} + 9 = 7609$

d.  $4424 = \underline{\hspace{1cm}} + 400 + 20 + 4$

e.  $\underline{\hspace{1cm}} = 5000 + 80 + 1$

3. State the value of each underlined digit.

**Example:** 3488 \_\_\_\_ **80** \_\_\_\_

- a. 6937 \_\_\_\_      b. 4874 \_\_\_\_  
c. 1210 \_\_\_\_      d. 8937 \_\_\_\_

4. Complete each statement by writing  $<$  (less than) or  $>$  (greater than) in the blank.

**Example:** 2345 \_\_\_\_  $<$  \_\_\_\_ 2435

- a. 6748 \_\_\_\_ 4678      b. 3434 \_\_\_\_ 3344  
c. 4120 \_\_\_\_ 4201      d. 9898 \_\_\_\_ 9889  
e. 7557 \_\_\_\_ 7755

5. Put each set of numbers in order from **least** (smallest) to **greatest** (biggest).

- a. 4572, 3905, 7238, 2939 \_\_\_\_  
b. 2134, 2314, 1234, 2431 \_\_\_\_  
c. 6767, 6776, 6667, 6676 \_\_\_\_  
d. 1010, 1101, 1001, 1100 \_\_\_\_

Check your answers in the Appendix.

Turn to Assignment Booklet 2A, and complete the activities for Day 7.



## Rounding Whole Numbers



Justin was tired after a long hike with his dad and little brother.

“There must be a million billion mosquitos here! And we walked about a hundred kilometres to find today’s camping spot!”

Is Justin using exact numbers? Did he count a *million billion* mosquitos? Did he count *one hundred* kilometres?

Part of what Justin is saying is exaggeration—he is stretching the truth. The other thing he is doing is estimating and rounding off his numbers. The numbers he is using are not exact; they are approximate. In this case it is not important that Justin uses exact numbers. He is giving the idea that there are many, many mosquitos and that the group walked a long distance.

Today you’ll find out why numbers are rounded. You will also find out how to round numbers.

## Why Round Numbers?

Sometimes when numbers are used, especially large numbers, it isn't necessary to be exact. In such cases, **rounded numbers** are used instead of exact numbers.

If a newspaper reporter writes that about 20 000 people attended the fair, the number being used is a rounded number. It may not be exact, but it gives the reader the general idea that many thousands of people attended the fair.

If you are told the town of Barrhead has a population of about 4200, you don't know **exactly** how many people live there, but the rounded number tells you that the population of Barrhead is quite small compared to the population of a city.

If you are estimating the time it would take to travel a long distance by car, it really doesn't matter if the distance is 985 km or 992 km. You can round the distance to 1000 km and figure out that it will probably take about 10 hours to complete the journey.

Rounding also helps solve everyday problems. It makes calculations faster and easier.

You want to buy a dozen large chocolate bars. Each bar costs \$1.85. You have \$20.00 in your wallet. Do you have enough money? Trying to calculate  $12 \times \$1.85$  in your head is a bit difficult. However, you know that \$1.85 is very close to \$2.00. So, by rounding \$1.85 up to \$2.00, the calculation becomes easier.

$$12 \times \$2.00 = \$24.00$$

Do you have enough money? Probably not.





Today you will learn two methods for rounding numbers:

- using a place-value chart
- using a number line

## Rounding to the Nearest Thousand

### Using a Place-Value Chart

When rounding numbers, it is best to decide ahead of time which place value they will be rounded to. Using a place-value chart makes this easier to see.



To round a number to the nearest **thousand**, look at the hundreds place-value column to see how many hundreds there are. If there are 5 or more hundreds, round up the number in the thousands column by 1. All numbers to the right change to 0.

#### Example 1

Round 5719 to the nearest thousand.

Th	H	T	O
5	7	1	9

To round a number to the nearest thousand, look at the hundreds column. Ask yourself, "Is this number 5 or greater?"

Th	H	T	O
6	0	0	0

If YES, then round the thousands up by 1. All numbers to the right of the thousands change to 0. The number 7 is greater than 5. So, the number in the thousands column is changed to 6. All other numbers change to 0.

The rounded number is 6000.

## Example 2

Round 5368 to the nearest thousand.

Th	H	T	O
5	3	6	8

Look at the number in the hundreds column. Ask yourself, "Is this number 5 or greater?"

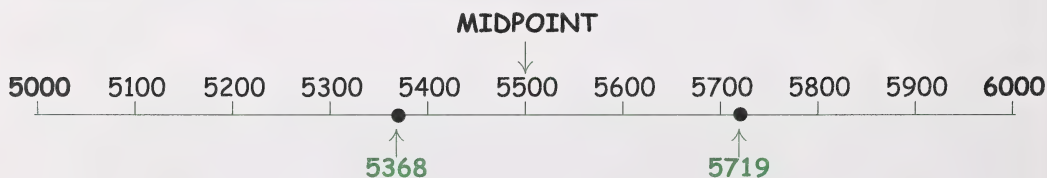
Th	H	T	O
5	0	0	0

If NO, then the thousands are not rounded up. All numbers to the right of the thousands change to 0. The number 3 is **not** greater than 5. So, the number in the thousands column remains a 5. All other numbers change to 0.

The rounded number is 5000.

## Using a Number Line

If you put the numbers to be rounded on a number line, you can see why some numbers are rounded up and some are not.



When rounding 5719 to the nearest thousand, use the hundreds to help decide whether or not to round up.

- If there are 5 or more hundreds, the number is found past the midpoint on the number line. The number 5719 has 7 hundreds. It is closer to 6000, so you would round up.
- If there are fewer than 5 hundreds, the number is found to the left of the midpoint. The number 5368 has only 3 hundreds. It is closer to 5000, so you would **not** round up.

1. Round the number in each question to the nearest thousand. Use the rounded numbers in the box for your answers.

2000   3000   4000   5000   6000   7000   8000

**Example:** 7613   8000

a. 5937   \_\_\_\_\_

b. 2846   \_\_\_\_\_

c. 6941   \_\_\_\_\_

d. 2329   \_\_\_\_\_

e. 5184   \_\_\_\_\_

f. 3697   \_\_\_\_\_

2. Round each number to the nearest thousand.

a. 2374 \_\_\_\_\_

b. 2745 \_\_\_\_\_

c. 9841 \_\_\_\_\_

d. 6289 \_\_\_\_\_

e. 8484 \_\_\_\_\_

f. 5555 \_\_\_\_\_



Check your answers in the Appendix.

## Rounding to the Nearest Ten or Hundred

So far, you have learned a strategy for rounding to the nearest thousand.

When rounding to the nearest **thousand**, use the next place-value column to the right (the hundreds) to decide whether or not to round up to the next thousand.

Rounding to tens or hundreds uses a strategy just like the one used for rounding to thousands.

When rounding to the nearest **hundred**, use the next place-value column to the right (the tens) to decide whether or not to round up to the next hundred.

When rounding to the nearest **ten**, use the next place-value column to the right (the ones) to decide whether or not to round up to the next ten.



## Using a Place-Value Chart

To round 2368 to the nearest ten, use the ones column to determine if you should round up the tens.

Th	H	T	O
2	3	6	8

Ask yourself,  
"Are there  
5 or more  
ones?"

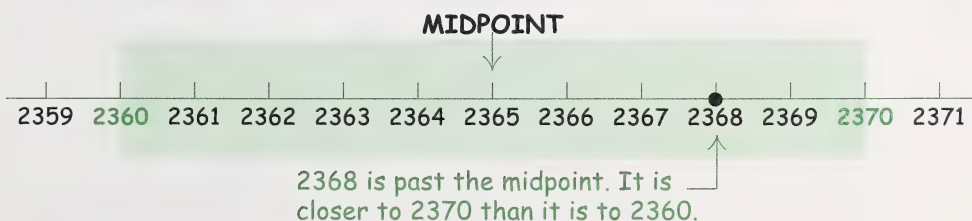
Th	H	T	O
2	3	7	0

Since the answer is "Yes,"  
round up the 6 tens to 7  
and change all numbers to  
the right to 0.

You can apply this strategy to rounding to hundreds as well. Just be sure to use the place-value column to the right of the hundreds (the tens) to determine whether you need to round up to the next hundred. (Ask yourself, "Are there 5 or more tens?")

## Using a Number Line

Placing the number on a number line helps you to see why the number should be rounded up.



3. Round each number to the nearest hundred.

**Example:** 1257 1300

a. 1383 \_\_\_\_\_

b. 6576 \_\_\_\_\_

c. 4954 \_\_\_\_\_

d. 9687 \_\_\_\_\_

e. 5085 \_\_\_\_\_

f. 8447 \_\_\_\_\_

4. Round each number to the nearest ten.

**Example:** 4637 4640

a. 3868 \_\_\_\_\_

b. 6506 \_\_\_\_\_

c. 4854 \_\_\_\_\_

d. 7499 \_\_\_\_\_

e. 2017 \_\_\_\_\_

f. 3098 \_\_\_\_\_

5. Use words to write the number for each of the following.

**Example:** 795 rounded to the nearest hundred

eight hundred

a. 869 rounded to the nearest ten

\_\_\_\_\_

b. 869 rounded to the nearest thousand

\_\_\_\_\_

c. 646 rounded to the nearest hundred

\_\_\_\_\_

- d. 175 rounded to the nearest hundred

---

- e. 175 rounded to the nearest ten

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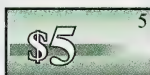
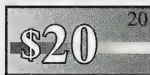
Check your answers in the Appendix.

## Rounding Money Amounts

Money amounts can also be rounded. Treat dollar amounts just as you treat whole numbers. Simply add a dollar sign. You may use a place-value chart or a number line to help you.

6. Add up each amount. Then round to the nearest ten dollars.

Example:



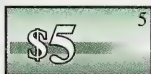
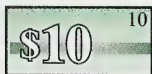
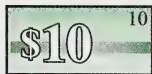
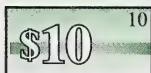
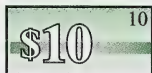
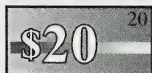
**\$83**

total amount

**\$80**

rounded amount

a.



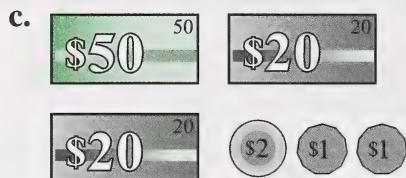
total amount

rounded amount



total amount

rounded amount

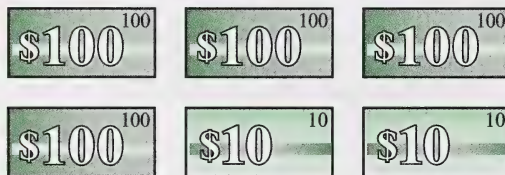


total amount

rounded amount

7. Add up each amount. Then round to the nearest hundred dollars.

**Example:**

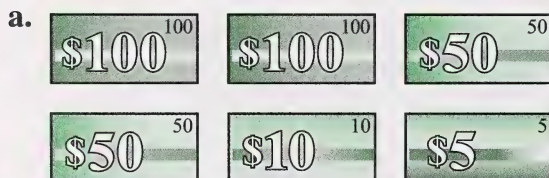


**\$420**

total amount

**\$400**

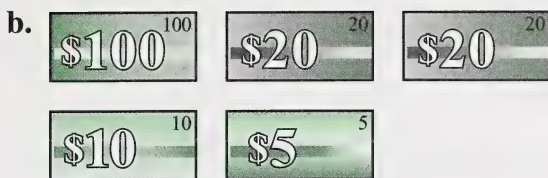
rounded amount



total amount

rounded amount





total amount

rounded amount



total amount

rounded amount

Check your answers in the Appendix.

## Taking Another Look

The following activity is optional. You may choose to do it or not. You **should** complete the activity if you feel you need more practice with the concepts in Section 1 of this module.

If you choose **not** to do the questions at this time, you may wish to return here later and complete the page before going on to the review activities for Day 9.

Turn to page 54 of your textbook. Do questions 1 to 6 from the Skill Bank. Answer these questions in the spaces provided. **Note:** It is not necessary to do all of the questions in the Skill Bank. Do only the questions shown on the next page.

**Skill Bank, Question 1:** \_\_\_\_\_

**Skill Bank, Question 2:**

a. four thousand two hundred eighteen \_\_\_\_\_

b. six hundred eighty \_\_\_\_\_

c. two thousand fifty-six \_\_\_\_\_

d. ten thousand seven hundred ninety \_\_\_\_\_

**Skill Bank, Question 3:**

a. 9465 \_\_\_\_\_

b. 4063 \_\_\_\_\_

**Skill Bank, Question 4:**

a. \_\_\_\_\_ b. \_\_\_\_\_

**Skill Bank, Question 5:**

Which numbers represent 6840? (Write only the letters.) \_\_\_\_\_

**Skill Bank, Question 6:**

a. \_\_\_\_\_ b. \_\_\_\_\_ c. \_\_\_\_\_

Check your answers in the Appendix.



Turn to Assignment Booklet 2A, and complete the activities for Day 8.



## Putting It All Together (I)



In Section 1 you discovered many new things about **numbers** and how they are used:

- You learned about the importance of numbers in everyday life.
- You practised the skills of estimating, counting, and rounding.
- You compared and ordered large numbers.
- You practised reading and writing numbers as words.
- You used base ten blocks to model large numbers.
- You explored different ways numbers can be shown.
- You learned more about place value and the number system.
- You reviewed the basic facts for addition and subtraction.

The things you have studied about numbers and the number system will be useful to you as you explore the operations of adding, subtracting, multiplying, and dividing in later modules.

Today you will show what you have learned about number concepts by completing several review questions. You will then spend some time working on a Challenge Activity designed to extend your thinking about numbers and number sense.

## Part 1: Reviewing the Concepts

For Part 1 you will complete the review questions for Day 9 in Assignment Booklet 2A. First, you may wish to look back through the Student Module Booklet to review the concepts covered in Section 1.

## Part 2: Challenge Activities

The Challenge Activities in Part 2 are designed to extend the ideas you have been learning about number concepts, and encourage you to explore new ideas. In Assignment Booklet 2A you will find two Challenge Activities. Choose **either** Activity A **or** Activity B (**or** you may do both if you wish).

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Turn to Day 9 in Assignment Booklet 2A, and complete the review questions in Part 1. Then do one or both of the Challenge Activities in Part 2.

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## Assessing What You Know (I)

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Today is the last day you will be working on Section 1: Number Concepts. You are to complete three activities in Assignment Booklet 2A:

- Showing What You Can Do
- Basic Number Facts
- Thinking About What You Know

Read the explanation of the activities in Parts 1, 2, and 3 before turning to Assignment Booklet 2A. Note that you will need the help of your home instructor for the activities in Part 1 and Part 2.



## Part 1: Showing What You Can Do



For this activity you will need the help of your home instructor. You will be working on a short activity while your home instructor observes you. As you work through the problem, try to explain clearly what you are doing.

Your home instructor may ask you questions like the following:

- “How do you know that?”
- “Why did you decide to do that?”
- “How did you get that answer?”

Your job is to explain what you are doing so that your home instructor can understand your thinking.



### Note to the Home Instructor

This performance assessment should take about 15 minutes. The Home Instructor’s Assessment Page and accompanying Student’s Assessment Page can be found in Day 10 of Assignment Booklet 2A. Remove both pages from the Assignment Booklet. Read over the student’s page so you are familiar with the student’s assigned task. You should also preview the interview questions and the checklist before the student begins working on the assigned task.

As the student works to answer the questions, encourage him or her to talk about what he or she is doing. **Allow the student to use any manipulatives or cut-out learning aids available to help solve the problem.** You may or may not wish to use some of the interview questions. Look for understanding and the student’s ability to explain clearly what he or she is doing to arrive at an answer. Indicate on the checklist whether you feel the student demonstrated the skills being assessed.

Attach both assessment pages to the Assignment Booklet before sending it in for marking.

## Part 2: Basic Number Facts



In this activity you will show how well you are doing at learning your basic number facts for addition and subtraction. Ask your home instructor to time you as you do each test.

## Part 3: Thinking About What You Know

In this activity you will spend some time looking back over Days 1 to 9 of the Student Module Booklet. Then you will complete some statements that tell about things you liked about this section of the module, things you didn't understand, and things you would like to learn more about. This information will be helpful to your teacher in determining how well you understood the information presented in the module.

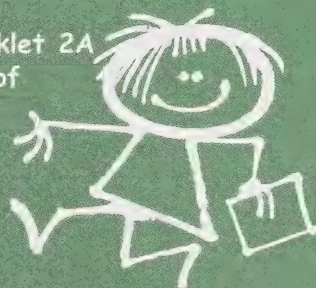
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When your home instructor is ready, turn to Assignment Booklet 2A, and complete the activities found in Parts 1, 2, and 3 of Day 10.

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This is the end of Section 1: Number Concepts. Check over Assignment Booklet 2A to make sure you have completed all of the assigned activities for each day. Remember that for Day 9 you need to complete the review questions in Part 1 and one or both Challenge Activities in Part 2.



Be sure to attach the **two** assessment pages from Day 10 to Assignment Booklet 2A. Then send Assignment Booklet 2A to your teacher.

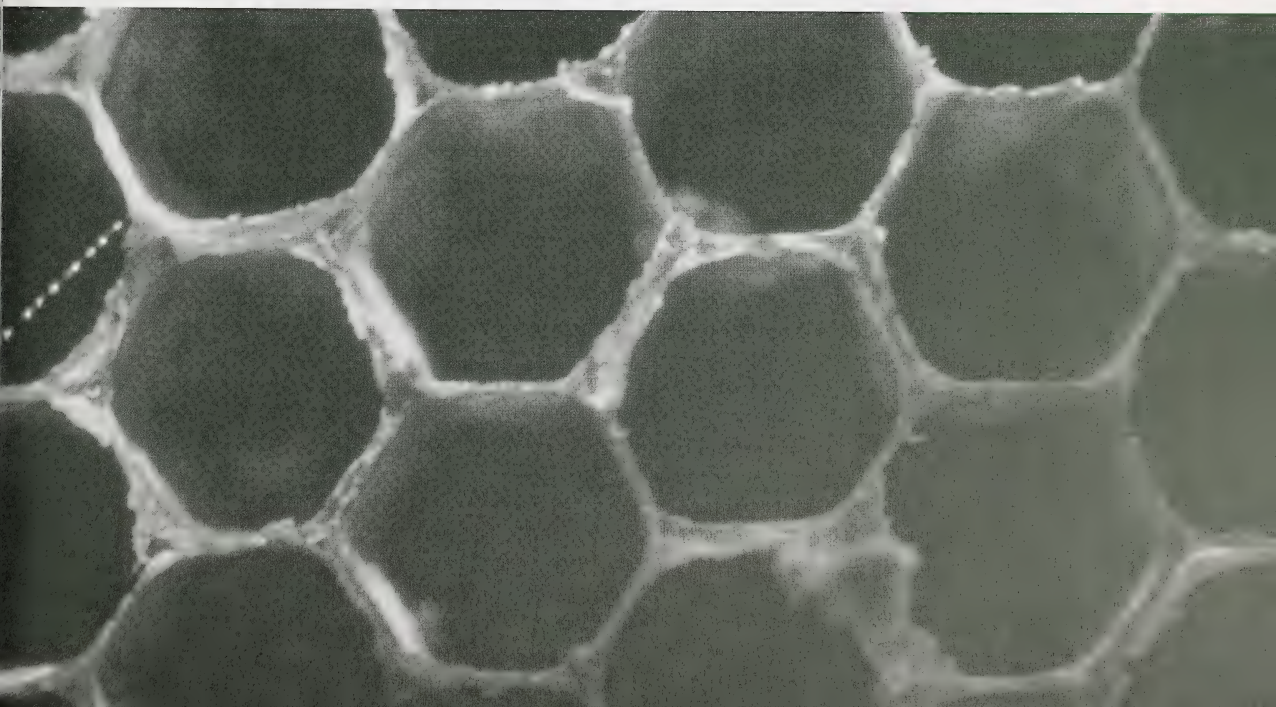






## Section 2

# Patterns





## Patterns



Have you ever heard of braille? Braille is a method of reading and writing used by people who are blind. If you were to look at a page of braille writing, you would see patterns of raised dots. To read braille, you move your fingers along each row of dots. Each dot or group of dots stands for a letter, number, or punctuation mark. The Braille system of writing uses a **pattern** of six dots.

Patterns are found everywhere. In this section, you will

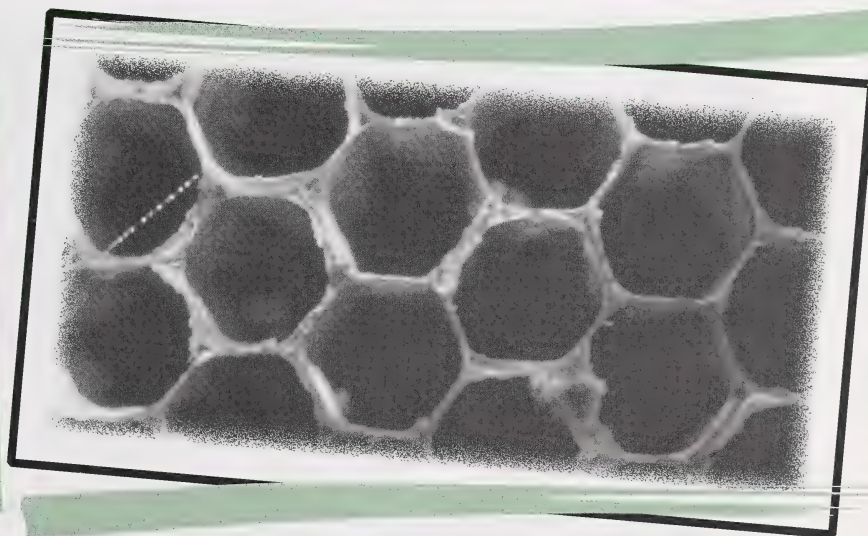
- look at different kinds of patterns
- learn about patterns that use numbers and about patterns that do not
- investigate patterns created by skip counting
- discover patterns in numbers and make predictions by using T-tables
- even use patterns to prove a theory
- be introduced to the Guess-and-Check strategy of problem solving
- review your multiplication and division number facts



You can find out more about braille and Louis Braille, the man who invented it, by visiting your library, contacting the Canadian National Institute for the Blind (CNIB), or using the Internet. One website you might visit is:

[http://www.cnib.ca/braille\\_information/index.htm](http://www.cnib.ca/braille_information/index.htm)

## Exploring Patterns



Earlier in this module you learned how numbers are so much a part of the world and so much a part of your daily life. When you take the time to examine these numbers, you will discover that many different kinds of patterns are formed as numbers are used. You have already discovered patterns that form when using base ten blocks. (See your Day 6 activities.)

### What Is a Pattern?

A **pattern** is created when something repeats. It could be a repeating design made up of shapes, lines, or dots. A pattern could also be a series of sounds, colours, words, or letters. In mathematics, a pattern is often a list of numbers repeating in a certain way.



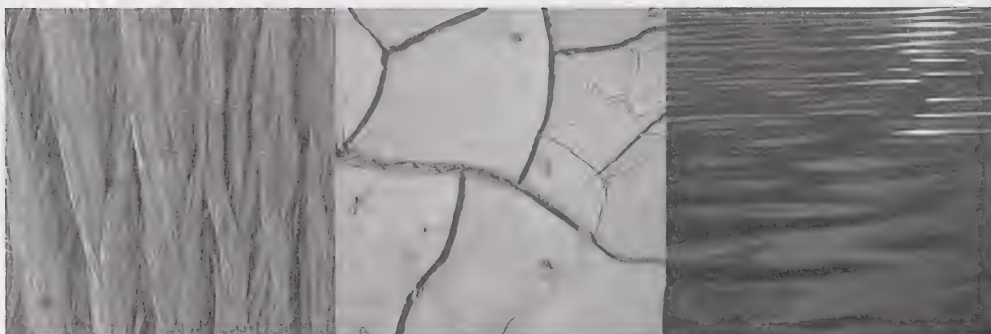
Patterns, like numbers, are everywhere. Patterns can be found in music, stories, games, books, clothes, and wallpaper, as well as almost anywhere that numbers appear.

Searching for patterns allows you to understand how things repeat or change. This knowledge allows you to predict what word, colour, shape, or number will occur next.

Take a look around inside your home. Do you see items such as the following?



Take a look around the outside of your home. Do you see items such as these?



What you are seeing in these items are patterns created by repeated designs. They can be found in nature or they can be made by people. Patterns can also be formed when numbers are used.



When you looked around your home, did you see any patterns that repeated over and over?

1. Describe three different patterns that you observed or that you have heard. **Hint:** Look at floor or wall tiles, bricks, wallpaper, clothing, or any other objects. Perhaps you can see something that has repeating colours or shapes. Think of a song or story you know that repeats certain parts over and over.

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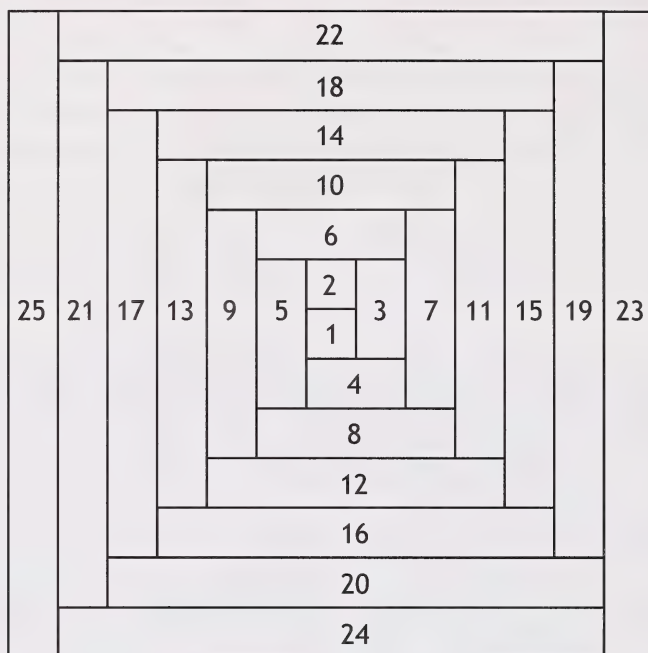
Check your answers in the Appendix.

## Creating Patterns



You can create a pattern yourself simply by causing things to repeat in different ways. Quilters often use repeated designs when they are designing a new quilt. The pattern of colours and shapes that results is often quite beautiful.

Here is a quilt pattern that uses many rectangular shapes of different sizes.



Find your pencil crayons or felt markers. Choose two different colours. Colour the quilt using only those two colours. Before you begin, decide on the pattern you will make. Use one of the following patterns or think of one of your own. Colour out from the centre of the quilt and watch as your pattern forms.

Pattern 1: Rectangle 1 ..... red  
 Rectangles 2, 3, 4, 5 ..... yellow  
 Rectangles 6, 7, 8, 9 ..... red  
 Rectangles 10, 11, 12, 13 ..... yellow  
 .....and so on

Pattern 2: All rectangles with even numbers ..... red  
 All rectangles with odd numbers ..... yellow

You can create patterns in many different ways. You can use colours, sounds, numbers, different shapes, and different sizes.

### Patterns with Colour



Look at the picture on pages 224 and 225 of your textbook. Do you see the bottom strand of beads that runs from one page to the next? Can you discover the colour pattern of the beads?

2. a. Write the pattern that you see. Start at the left. **Hint:** Look carefully at the left end of the strand of beads. The small purple bead belongs to another pattern.

red, red, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

- b. If the same pattern is followed, what colour will the next seven beads be (at the far right)?

blue, red, red, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_



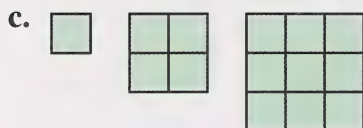
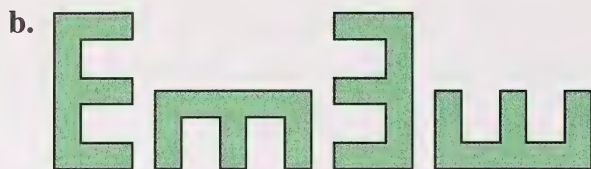
Check your answers in the Appendix.

### Patterns with Shapes

Sometimes a series of objects or shapes is organized into a pattern.

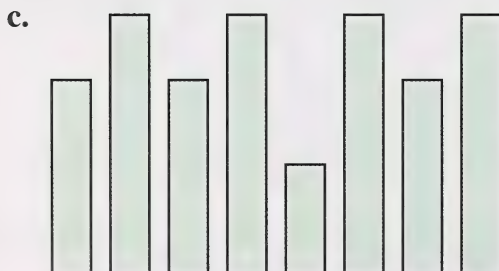
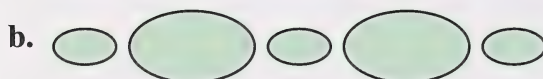
3. Look at each pattern of shapes and predict what the next two shapes will be. Draw them.





### Patterns with Sizes

4. Patterns can also be created by using different sizes of objects. Predict the size of the next two shapes in each pattern. Draw them.



Check your answers in the Appendix.





## Patterns with Sounds

5. Do you have a cuckoo clock or grandfather clock at home? These clocks have repeating sounds. Sounds that repeat create a pattern. Look at each sound pattern, and predict what the next three sounds will be. Write them.

a. clap, clap, snap, clap, clap, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b. ti, ti, ta, ta, ta, ti, ti, ta, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c. boom, click, boom, click, click, boom, click, boom, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_

## Patterns with Numbers

6. Look at each pattern of numbers, and predict what the next three numbers will be. Then describe the pattern. An example is done for you.

**Example:** 205, 203, 201, 199, 197, 195

pattern: Subtract 2.

a. 6, 12, 18, 24, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

pattern: \_\_\_\_\_

b. 1, 10, 100, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

pattern: \_\_\_\_\_

c. 951, 901, 851, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

pattern: \_\_\_\_\_

Check your answers in the Appendix.








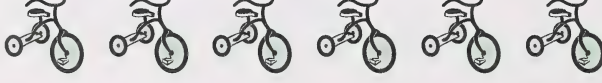
## Finding and Using Patterns

Patterns can be very useful. Once you have identified a pattern, you can use the pattern to find extra information.

In the following activities you will identify a variety of number patterns and use the information to predict what the next numbers will be.

### How Many Wheels?

7. Complete the following chart, which shows the pattern of the number of wheels to the number of tricycles.

	Number of Tricycles	Number of Wheels
		3
		6
a.		
b.		
c.		
d.		

8. Can you predict beyond the information given in the chart? How many wheels are found on

a. 7 tricycles? \_\_\_\_\_

b. 10 tricycles? \_\_\_\_\_

c. 25 tricycles? \_\_\_\_\_

9. You can write the information from the chart on a **T-table**. In this T-table, **T** stands for tricycles, and **W** stands for wheels.

Complete the following T-table.

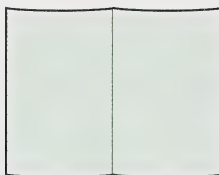
T	W
0	0
1	3
2	6
3	9
4	
5	
6	
7	
8	
9	
10	

Check your answers in the Appendix.



## How Many Sections?

Take a piece of paper and fold it in half. When you open it up, you find that after making one fold there are



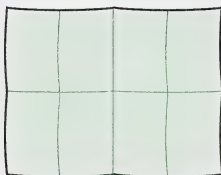
2 sections.

If you fold the paper in half again and then open it up, you find that after making two folds there are



4 sections.

Fold the paper once again. Open it up and you should find that after making three folds there are



8 sections.

If you make a T-table to record the information, it should look like this.

Folds	Sections
1	2
2	4
3	8
4	
5	



Fold the paper a fourth time. When you open the paper, count the number of sections. Then fill in the T-table for the number of sections after four folds.

Did you find that there were 16 sections? If you did, you counted correctly. Have you already discovered the pattern in the T-table?

- 10.** Before actually folding the paper a fifth time, predict how many

sections there will be after five folds. \_\_\_\_\_ sections

Look at the pattern forming on the Sections side of the T-table. Write your prediction on the table.

- 11.** What happens to the number of sections each time you make one more fold?

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Check your answers in the Appendix.

- 12.** Now fold the paper a fifth time, open it up, and count the sections. Was your prediction correct? \_\_\_\_\_

- 13. a.** How many sections do you think there would be after making a sixth fold?

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- b.** Explain why you think so.

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Check your answers in the Appendix.





## Taking Another Look

The following activities are optional. You may choose to do them or not. You **should** complete the activities if you had difficulty with the questions in Day 11, or if you feel you just need more practice with shape patterns or number patterns.

If you choose **not** to do the questions at this time, you may wish to return here later to review the concepts on shape or number patterns before completing the review activities for Day 17.

### Shape Patterns

1. Draw the next three shapes for each pattern shown.

a.



b.



c.



## Number Patterns

2. Write the next four numbers in each pattern.

a. 736, 836, 936, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b. 6455, 6355, 6255, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c. 8875, 8865, 8855, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d. 2041, 2141, 2241, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e. 3717, 3727, 3737, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Check your answers in the Appendix.

Turn to Day 11 in the Cut-Out Learning Aids section of the Appendix. Cut out the squares and triangles. You will need these shapes to complete the Assignment Booklet questions for Day 11.

Turn to Assignment Booklet 2B, and complete the activities for Day 11.





## Skip Counting



### What Is Skip Counting?



Three, six, nine.  
Travel down the line.

Two, four, six, eight.  
Who do we appreciate?



Have you yelled out a cheer or chanted a skipping song like this? If you have, then you already know something about skip counting.

**Skip counting is counting in a pattern that is created by omitting certain numbers.**



For example, counting by 2s is a form of skip counting where you count every second number.

- 2, 4, 6, 8, 10, 12, ...
- 48, 50, 52, 54, 56, 58, ...
- 5, 7, 9, 11, 13, 15, ...

As you can see, when counting by 2s, the starting number determines whether the numbers will be odd or even.

1. Identify the pattern for each skip-counting pattern. Then fill in the missing numbers for each.

a. counting by \_\_\_\_\_

2, 4, 6, \_\_\_\_\_, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, 20, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_

b. counting by \_\_\_\_\_

3, 6, \_\_\_\_\_, 12, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 24,  
\_\_\_\_\_, \_\_\_\_\_

c. counting by \_\_\_\_\_

5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, 35, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d. counting by \_\_\_\_\_

\_\_\_\_\_, \_\_\_\_\_, 30, \_\_\_\_\_, 50, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. Write the numbers from 50 to 70 skip counting by 2s.

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3. Write the numbers from 120 to 150 skip counting by 5s.

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4. Write the numbers from 3060 to 3160 skip counting by 10s.

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5. Write the numbers from 800 to 2000 skip counting by 100s.

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Check your answers in the Appendix.



Have you ever tried counting backwards from 100? If you have, then you shouldn't have any trouble skip counting backwards.

6. Fill in the missing numbers for each of the number patterns by skip counting backwards. Tell by what number you skip count backwards.

a. counting backwards by \_\_\_\_\_

30, 28, 26, \_\_\_\_\_, 22, \_\_\_\_\_, \_\_\_\_\_,

\_\_\_\_\_, 14, \_\_\_\_\_

**b.** counting backwards by \_\_\_\_\_

1500, 1400, \_\_\_\_\_, 1200, \_\_\_\_\_, \_\_\_\_\_, 900,  
\_\_\_\_\_, \_\_\_\_\_

**c.** counting backwards by \_\_\_\_\_

230, 227, 224, \_\_\_\_\_, 218, \_\_\_\_\_, 212, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_

**d.** counting backwards by \_\_\_\_\_

10 000, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 6000,  
\_\_\_\_\_, \_\_\_\_\_

**e.** counting backwards by \_\_\_\_\_

\_\_\_\_\_, 90, 85, \_\_\_\_\_, \_\_\_\_\_, 70, \_\_\_\_\_,  
\_\_\_\_\_

**f.** counting backwards by \_\_\_\_\_

\_\_\_\_\_, 64, 56, \_\_\_\_\_, 40, \_\_\_\_\_, 24,  
\_\_\_\_\_, 8

**g.** counting backwards by \_\_\_\_\_

220, \_\_\_\_\_, \_\_\_\_\_, 190, 180, \_\_\_\_\_, 160,  
\_\_\_\_\_

Check your answers in the Appendix.



You can also use skip counting when you count up the value of a set of coins.

7. Find the value of each set of coins. Tell what number you must skip count by.

a.



\_\_\_\_\_

Skip count by \_\_\_\_\_.

b.



\_\_\_\_\_

Skip count by \_\_\_\_\_.

c.



\_\_\_\_\_

Skip count by \_\_\_\_\_.

Check your answers in the Appendix.





## Skip-Counting Patterns on the Number Chart

You have already discovered that numbers can create interesting patterns. By using a number chart and colouring in numbers as you skip count, you can see some of these unique patterns.

You need felts, crayons, or pencil crayons for the following activities.

8. a. Starting with 0, colour in all the numbers counted as you skip count by 2s.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

- b. Describe in your own words the pattern you created. What did you notice about the numbers that you shaded in?

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Check your answers in the Appendix.



9. Starting at 0, colour in each number counted as you skip count  
by 4s.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

10. Starting at 0, colour in each number counted as you skip count

a. by 3s

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

b. by 5s

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

11. Starting at 0, colour in each number counted as you skip count

a. by 8s

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

b. by 9s

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

c. by 10s

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

d. by 11s

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Check your answers in the Appendix.



## Other Number-Chart Patterns

Other patterns in number charts appear when you colour in certain numbers.

- 12. a.** Colour in all the squares whose digits add up to 8.

### Example

Since  $8 = 8$ , colour in 8.

Since  $1 + 7 = 8$ , colour in 17.

Since  $2 + 6 = 8$ , colour in 26.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99



Check your answers in the Appendix.

- b.** Colour in all the squares whose two digits differ by 1. The order of the digits does not matter.

### Example

$2 - 1 = 1$  ← Colour in 12.

$2 - 1 = 1$  ← Colour in 21.

$3 - 2 = 1$  ← Colour in 23.

$3 - 2 = 1$  ← Colour in 32.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99



c. Colour in the squares whose digits add up to 10.

### Example

$5 + 5 = 10$  ← Colour in 55.

$6 + 4 = 10$  ← Colour in 64.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

If you colour in certain multiples on the number chart, patterns can also be found.

**Remember:** When you multiply a number by 1, 2, 3, 4, and so on, you get a **multiple** of the number you started with.

### Example

What are the first four multiples of 5?

$$1 \times 5 = 5 \quad 2 \times 5 = 10 \quad 3 \times 5 = 15 \quad 4 \times 5 = 20$$

The first four multiples of 5 are 5, 10, 15, and 20.



**13.** Colour in all the squares that are multiples of 3.

**Example**

$1 \times 3 = 3$  ← Colour in 3.

$2 \times 3 = 6$  ← Colour in 6.

$3 \times 3 = 9$  ← Colour in 9.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

**14.** Look back at all of the number charts you worked on in this lesson.

- a.** Can you find a chart similar to the one that shows multiples of 3 (question 13)? If so, which number-chart pattern is similar?

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- b.** Can you see how skip counting and finding multiples are related? Explain your answer.

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Check your answers in the Appendix.



## Basic Number Facts Practice



Today you will begin a review of the multiplication facts you learned in Grade 3. Flash cards are a good way to keep track of the facts that you don't know. As you go through the pile of flash cards, separate them into two piles: those you know and those you need to learn. Practise some of the facts that you need to learn each day.

Here are the multiplication facts that you should be familiar with by now:

$1 \times 1 = 1$	$2 \times 1 = 1$	$3 \times 1 = 3$	$4 \times 1 = 4$	$5 \times 1 = 5$
$1 \times 2 = 2$	$2 \times 2 = 4$	$3 \times 2 = 6$	$4 \times 2 = 8$	$5 \times 2 = 10$
$1 \times 3 = 3$	$2 \times 3 = 6$	$3 \times 3 = 9$	$4 \times 3 = 12$	$5 \times 3 = 15$
$1 \times 4 = 4$	$2 \times 4 = 8$	$3 \times 4 = 12$	$4 \times 4 = 16$	$5 \times 4 = 20$
$1 \times 5 = 5$	$2 \times 5 = 10$	$3 \times 5 = 15$	$4 \times 5 = 20$	$5 \times 5 = 25$
$1 \times 6 = 6$	$2 \times 6 = 12$	$3 \times 6 = 18$	$4 \times 6 = 24$	$5 \times 6 = 30$
$1 \times 7 = 7$	$2 \times 7 = 14$	$3 \times 7 = 21$	$4 \times 7 = 28$	$5 \times 7 = 35$
$1 \times 8 = 8$	$2 \times 8 = 16$	$3 \times 8 = 24$	$4 \times 8 = 32$	$5 \times 8 = 40$
$1 \times 9 = 9$	$2 \times 9 = 18$	$3 \times 9 = 27$	$4 \times 9 = 36$	$5 \times 9 = 45$

$6 \times 1 = 6$	$7 \times 1 = 7$	$8 \times 1 = 8$	$9 \times 1 = 9$
$6 \times 2 = 12$	$7 \times 2 = 14$	$8 \times 2 = 16$	$9 \times 2 = 18$
$6 \times 3 = 18$	$7 \times 3 = 21$	$8 \times 3 = 24$	$9 \times 3 = 27$
$6 \times 4 = 24$	$7 \times 4 = 28$	$8 \times 4 = 32$	$9 \times 4 = 36$
$6 \times 5 = 30$	$7 \times 5 = 35$	$8 \times 5 = 40$	$9 \times 5 = 45$
$6 \times 6 = 36$	$7 \times 6 = 42$	$8 \times 6 = 48$	
$6 \times 7 = 42$	$7 \times 7 = 49$		
$6 \times 8 = 48$			


You should also know the "Zero Rule" for multiplication.  
Zero times any number always equals zero.



Example

$$0 \times 7 = 0 \quad 7 \times 0 = 0$$

$$0 \times 4 = 0 \quad 4 \times 0 = 0$$



Ask your home instructor to time you as you complete the following timed exercise. Your goal is to complete all 25 questions in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

## Basic Number Facts Practice

### Multiplication Number Facts



Number Completed in 2 Minutes \_\_\_\_\_

Number Correct in 2 Minutes \_\_\_\_\_

Record your score on the Number Facts Progress Chart.



### 15. Multiplication Number Facts

**Timed Exercise: 2 minutes**

$6 \times 7 =$

$5 \times 8 =$

$3 \times 7 =$

$5 \times 9 =$

$1 \times 6 =$

$$\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ \times 0 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$$

$2 \times 8 =$

$6 \times 5 =$

$8 \times 4 =$

$6 \times 6 =$

$8 \times 5 =$

$$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$$

$4 \times 9 =$

$3 \times 8 =$

$7 \times 0 =$

$5 \times 5 =$

$7 \times 5 =$



Check your answers in the Appendix.



## Taking Another Look

The following activities are optional. You may choose to do them or not. You **should** complete the activities if you had difficulty with the questions in Day 12 or if you feel you just need more practice with skip counting.

If you choose **not** to do the questions at this time, you may wish to return here later to review the concepts on skip counting before completing the review activities for Day 17.

### Skip Counting

Skip counting is counting in a pattern by omitting numbers.

When you count by 2s, skip every other number

- Skip counting by 2s from 0

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, ...

0, 2, 4, 6, 8, 10, ...

- Skip counting by 2s from 1

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, ...

1, 3, 5, 7, 9, 11, ...

When you count by 3s, count one number and skip the next two.

- Skip counting by 3s from 0

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, ...

0, 3, 6, 9, 12, 15, ...

- Skip counting by 3s from 27

27, 30, 33, 36, 39, 42,...

Skip counting by 5s forwards or backwards.

- Forwards from 0

0, 5, 10, 15, 20, 25,...

- Backwards from 25

25, 20, 15, 10, 5, 0

1. Continue each skip-counting pattern. Tell what number is being used to skip count by.

- a. Skip counting by \_\_\_\_\_

6, 8, 10, 12, 14, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

- b. Skip counting by \_\_\_\_\_

35, 40, 45, 50, 55, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

- c. Skip counting by \_\_\_\_\_

1, 4, 7, 10, 13, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

- d. Skip counting by \_\_\_\_\_

445, 435, 425, 415, 405, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

- e. Skip counting by \_\_\_\_\_

943, 953, 963, 973, 983, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. Starting at 0, skip count

a. by 2s to 24

---

b. by 4s to 32

---

c. by 7s to 63

---

3. Skip count

a. by 10s from 16 to 96

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b. by 5s from 20 to 65

---

c. by 3s from 9 to 30

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Check your answers in the Appendix.

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Turn to Assignment Booklet 2B, and complete the activities for Day 12.

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## Discovering Patterns Using T-Tables

Are you a good detective? Are you good at discovering things?

Today you will discover how T-tables can be used to solve several different problems. For each problem, you will use a T-table to discover the pattern. The patterns you will make are formed by placing different shapes in a row or chain. Such patterns are called **chain patterns**.



In Day 11, you were introduced to T-tables. A T-table is a simple way to record information using a two-column table. The T-shape allows you to label each column at the top and record information below. In Day 11, the T-table was used to record information about the total number of wheels found on several tricycles.

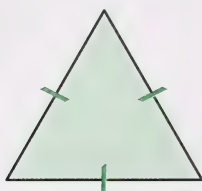
Number of Tricycles	Number of Wheels
	3
	6
	9
	12
	15
	18

Number of Tricycles	Number of Wheels
1	3
2	6
3	9
4	12
5	15
6	18

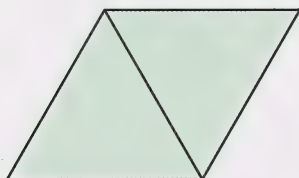
You can use T-tables whenever you want to keep track of how the numbers you are working with are changing. In other words, a T-table helps you discover if a pattern exists in the way the numbers change. In the tricycle example, you saw that the total number of wheels increased by 3 each time one more tricycle was added.

## Triangles in a Row

This is the top view of a triangular table. A tick (|) shows that **one** person can sit on each side of the table.



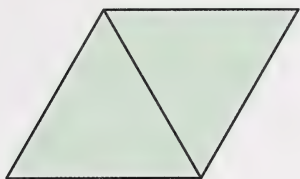
1. How many people can sit at this table? \_\_\_\_\_ people
  
2. a. To make a bigger table for more people, two tables can be moved together like this.



Put a tick (|) at each place where **one** person can sit.

- b. How many people can sit at this table? \_\_\_\_\_ people

3. a. Add one more table to the following drawing. Put a tick ( / ) at each place where one person can sit.



- b. How many people can sit at this table? \_\_\_\_\_ people

4. a. Now make a drawing of 4 triangular tables in a row. Put a tick ( / ) at each place where one person can sit.

- b. How many people can sit at this table? \_\_\_\_\_ people

Check your answers in the Appendix.

5. You can use a T-table to record the number of people that can be seated as the number of tables increases.

- a. Complete the following table.

Number of Tables	Number of People Seated
1	3
2	4
3	
4	

- b. Predict how many people can be seated at 5 tables. \_\_\_\_\_ people

Write this information on the T-table.

- c. Predict how many people can be seated at 6 tables. \_\_\_\_\_ people

Write this information on the T-table.

- d. Predict how many people can be seated at 15 tables. \_\_\_\_\_ people

Write this information on the T-table.

- e. In your own words, describe the pattern that you discovered.

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Check your answers in the Appendix.

## Squares in a Row

Suppose that instead of using triangular tables you used square tables. Would the pattern be the same? Turn to page 232 of your textbook. Look at the top half of the page.

Use the square cutouts from Day 11 to model this pattern.

Number of Square Tables	Number of People Seated
1	4
2	6
3	8
4	



6. a. Draw a diagram showing 4 tables placed in a row. Put a tick (|) at each place where one person can sit.

- b. How many people can be seated at a row of 4 tables?

\_\_\_\_\_ people (Write this number in the T-table.)

- c. Can you see a pattern in the numbers in the T-table? Describe the pattern.

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Check your answers in the Appendix.





7. Try using the pattern (from question 6.c.) to discover how many people can be seated when 8 tables are placed in a row. (If you need to, use the cutouts or draw the 8 tables.)

Tables	People
1	4
2	6
3	8
4	10
8	?

\_\_\_\_\_ people can be seated when 8 tables are placed in a row.



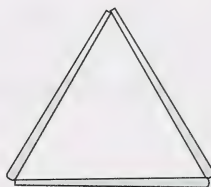
Check your answers in the Appendix.

## Discovering Patterns Using Toothpicks

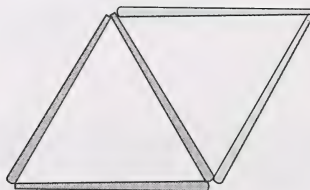


For this activity you will use toothpicks to make models. You need about 40 toothpicks. Use the diagrams to help you make the models.

Use 3 toothpicks to make 1 triangle.



Make 2 triangles by adding 2 more toothpicks to one side of the first triangle.



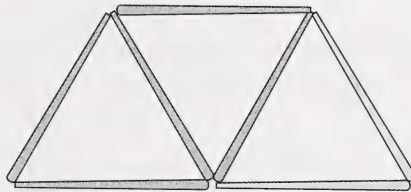
8. How many toothpicks did you use altogether to make 2 triangles?

\_\_\_\_\_ toothpicks



Check your answers in the Appendix.

Make 3 side-by-side triangles by adding 2 more toothpicks.



9. How many toothpicks were needed in all to make 3 triangles?

\_\_\_\_\_ toothpicks



Check your answers in the Appendix.

10. You can use a T-table to display the information from your models.

Number of Triangles	Number of Toothpicks
1	3
2	5
3	7
4	
5	
6	

a. Complete the T-table show above.

b. Can you see a pattern? Explain what you see.

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11. How many toothpicks would be needed for 10 triangles? (Use a T-table or make a model with toothpicks to help you find the answer.)

\_\_\_\_\_ toothpicks

Check your answers in the Appendix.



## Patterns in T-Tables

12. Look at each T-table that follows. Complete each table; then describe the pattern by writing a rule on the given lines. An example is done for you.

Ask yourself: "What must be done to the number in the first column to change it to the number in the second column?"



**Example**

Number of Hands	Number of Fingers
1	5
2	10
3	15
4	20
5	25

Pattern: Multiply the number of hands by 5.



**a.**

First Number	Second Number
7	9
8	10
9	
10	
11	

Pattern: \_\_\_\_\_

**b.**

First Number	Second Number
2	4
3	9
4	16
5	
6	
7	

Pattern: \_\_\_\_\_

**c.**

Number of Cows	Number of Legs
6	24
7	
10	
11	
12	

Pattern: \_\_\_\_\_

d.

First Number	Second Number
21	10
41	30
71	60
91	
101	

Pattern: \_\_\_\_\_

e.

Number of Dollar Coins	Number of Dimes
1	10
2	
3	
5	
9	

Pattern: \_\_\_\_\_

Check your answers in the Appendix.

## Taking Another Look

The following activity is optional. You may choose to do it or not. You **should** complete the activity if you had difficulty with the questions in Day 11 or if you feel you just need more practice with shape patterns or number patterns.

If you choose **not** to do the questions at this time, you may wish to return here later to review the concepts on shape or number patterns before completing the review activities for Day 17.



## Patterns Help Make Predictions

The purpose of discovering a pattern is to help you to make predictions beyond the information provided. For example, if you look at the following T-table, you may discover a pattern in the numbers. Can you predict what number will appear opposite 5?

First Number	Second Number
1	2
2	4
3	6
4	8
5	?



If you said 10, you have discovered the pattern. But how did you arrive at the number 10? If you read down the second column, you might have discovered the skip counting pattern 2, 4, 6, 8, ....

First Number	Second Number
1	2
2	4
3	6
4	8
5	10

There's another pattern, however, that can be found by reading across from one column to the next. You find this pattern by asking yourself, "How does the first number change to become the second number?" Or, you could ask, "What must be done to the first number to cause it to change into the second number?"

First Number	Second Number
1	2
2	4
3	6
4	8
5	

In the T-table, 1 changes to 2.  
2 changes to 4.  
3 changes to 6.  
4 changes to 8.

So, what will 5 change to?

Can you see that in order to obtain the second number, **the first number is always multiplied by 2**? This is called the **rule** for forming the pattern.

### Example

Use a pattern rule to predict the second number in the following table. Write the rule on the lines. Write the numbers in the T-table.

First Number	Second Number
1	3
2	6
3	9
6	
10	
11	
25	
100	

Rule: \_\_\_\_\_





When I look at the T-table, I can see that  
1 changes to 3,  
2 changes to 6, and  
3 changes to 9.  
I can see the numbers for the second column are  
found by multiplying the first number by 3. That  
tells me what the rule will be!

First Number	Second Number
1	3
2	6
3	9
6	18
10	30
11	33
25	75
100	300

The complete table will look  
like this!



Rule: Multiply the first number by 3.

Study each T-table, and find the pattern. First, you'll need to discover the rule for how the number in the first column changes to the number in the second column. Write the rule on the lines. Then complete each table.

1.

First Number	Second Number
1	5
2	10
3	15
4	
5	
10	
20	

Rule: \_\_\_\_\_

2.

First Number	Second Number
2	5
3	6
6	9
7	
9	
27	
72	

Rule: \_\_\_\_\_

3.

First Number	Second Number
2	4
3	5
7	9
14	
39	
101	
282	

Rule: \_\_\_\_\_

4.

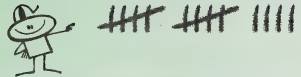
First Number	Second Number
5	0
6	1
10	5
20	
29	
89	
145	

Rule: \_\_\_\_\_

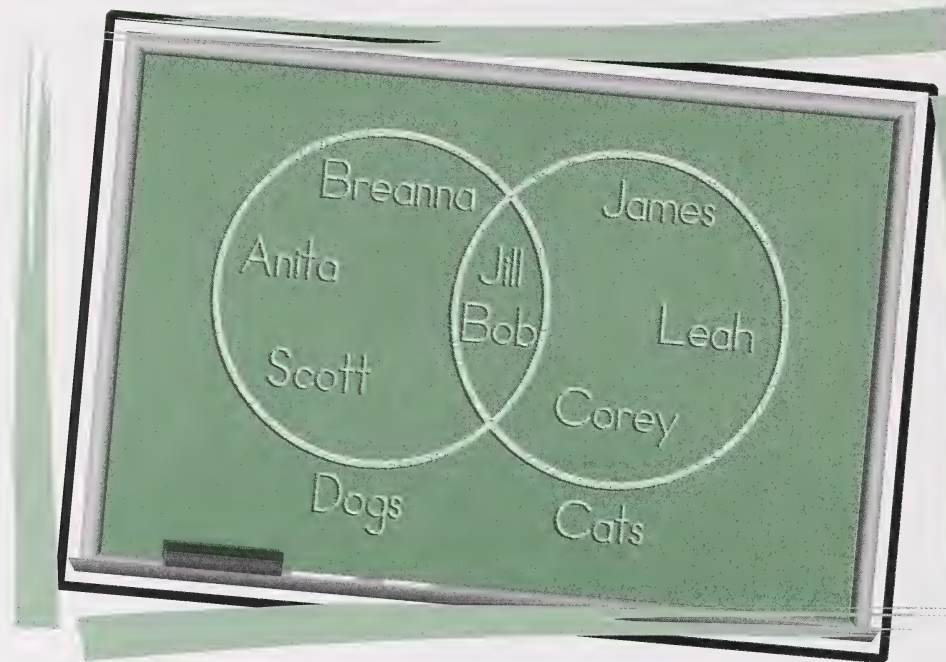
Check your answers in the Appendix.

Turn to Assignment Booklet 2B, and complete the activities for Day 13.





## Finding Patterns in Data



The more you work with a set of numbers, the easier it is to see patterns forming in those numbers. Some patterns can be spotted right away. Other patterns appear only after the numbers have been organized in a special way.

You are already familiar with several ways of organizing numbers. In Day 12 you coloured the skip-counting numbers on a hundreds chart. Once the numbers were coloured, you could see patterns forming. Later on, you used T-charts to organize numbers into two columns so that you could find a pattern to explain how the numbers changed.

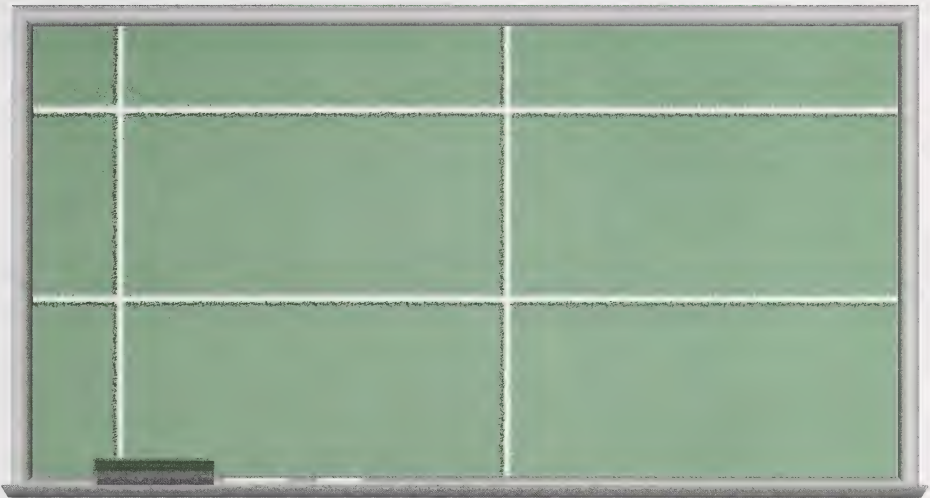
Today, you will look at two more ways to organize data (or numbers) so that you can more easily see if there are any patterns forming.

Two useful tools for organizing data and finding patterns are

- Carroll diagrams
- Venn diagrams



## Using Carroll Diagrams



A Carroll diagram is a four-section grid used to sort things into groups or sets. Work through the following problem to see how a Carroll diagram can be used to organize data.



There were 15 children playing in the playground:

Brent	Barry	Beth
Roxanne	Bonnie	Rachel
Randy	Bradley	Brian
Rita	Rose	Ron
Bart	Renee	Ralph

- All of the children were wearing either red hats or blue hats.
- All the boys were wearing blue hats, except Ralph, Ron, and Randy.
- All the girls were wearing red hats except Bonnie and Beth.

1. Sort the children into groups using a Carroll diagram.

	Blue Hats	Red Hats
Boys	Brent	
Girls		Roxanne

- a. First, look at how each box in the Carroll diagram is labelled.

The labels on the left side tell you that the top two boxes are for boys, and the bottom two boxes are for girls. The labels along the top of the diagram tell you that the two large boxes on the left are for children wearing blue hats. The two large boxes on the right are for children wearing red hats.

- b. Next, choose one name at a time from the list and place it in the correct box using the information given.

For example, the first name is Brent. This is a boy's name, and you are told he is wearing a blue hat. Put **Brent** in the top left-hand box. The next name, Roxanne, is a girl's name. You are told she is wearing a red hat, so you would write **Roxanne** in the bottom right-hand box.

- c. Then put the rest of the names from the list into the correct boxes.

Check your answers in the Appendix.



2. Now use the Carroll diagram to answer these questions.

- a. How many children are wearing blue hats? \_\_\_\_\_
- b. How many girls are wearing red hats? \_\_\_\_\_
- c. Are there more girls wearing blue hats or more boys wearing red hats? \_\_\_\_\_

Check your answers in the Appendix.

Did you find the data easier to read and understand once you filled in the Carroll diagram?

Carroll diagrams also make it easier to see patterns.

3. Look carefully at the names in each of the four boxes. What pattern do you see in the way the names are grouped?

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4. If you have discovered the pattern, you will be able to answer these two questions.

- a. Two more children came to the playground. Once was named Betty and one was named Roy. What colour of hat was each child wearing?

Betty \_\_\_\_\_ Roy \_\_\_\_\_

- b. Another boy came to the park. He was wearing a blue hat. If his name follows the pattern, what might his name be? \_\_\_\_\_

Check your answers in the Appendix.

For the following question, use a Carroll diagram to organize the data. Then tell what patterns you can see.

5. a. Skip count by 5s up to 100. Write the numbers here.

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- b. Sort the numbers from 5.a. into the correct sections of the Carroll diagram.

	Less Than or Equal to 50	Greater Than 50
Odd		
Even		

- c. Describe any patterns you can see in the way the numbers appear in the Carroll diagram.

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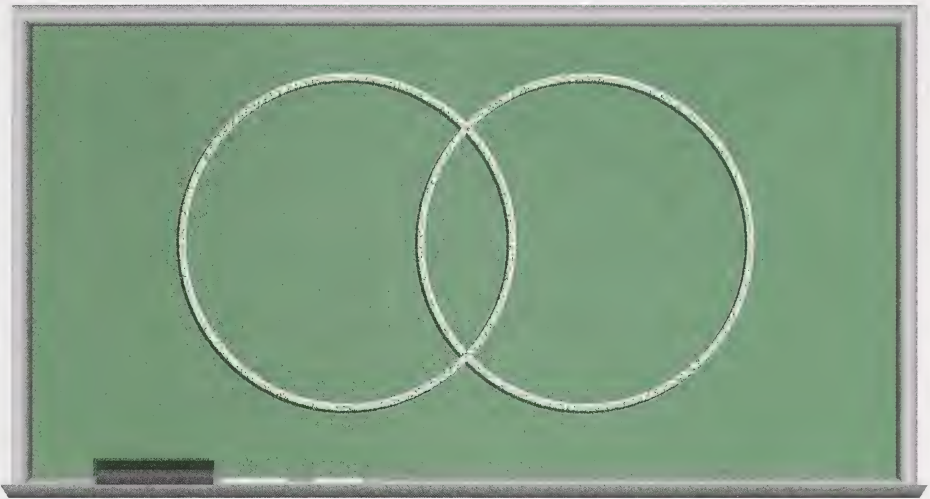
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Check your answers in the Appendix.





## Using Venn Diagrams



A Venn diagram is a kind of drawing that uses overlapping circles to organize data into groups or sets. In a Venn diagram, data can be in more than one group at a time. To show this, the data are placed in the overlapping spaces.

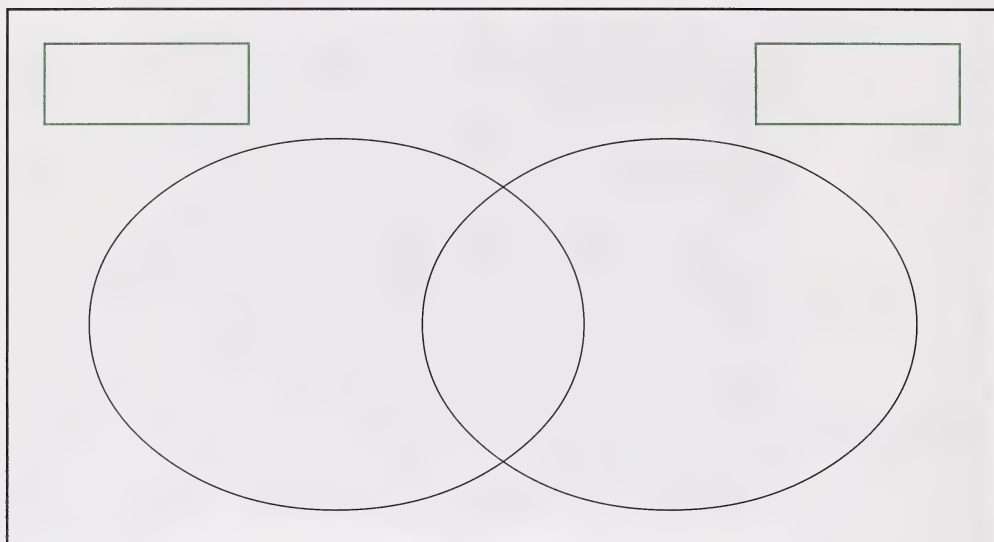
### Example

Zack went to the pet shop. He saw 18 cats. Of these cats, 10 had short hair, 9 were grey, and 6 were grey **and** had short hair.

- How many cats were **only** grey?
- How many had **only** short hair?
- How many were **not** grey and **didn't** have short hair?



6. Sort the cats into groups using a Venn diagram.



- a. First, put labels near each circle that tell how the cats are being grouped.

In the problem, the cats are grouped in two ways:

- those that were grey
- those that had short hair

Label the left circle **Grey** and the right circle **Short Hair**.

- b. Next, find the overlapping section.

If the left circle means **grey** and the right circle means **short hair**, then the overlapping section means **grey and short-haired**.

In the overlapping space, write the number of cats that are grey with short hair.

Check your answers in the Appendix.



- c. Find the number of cats that were **only grey**.

The problem tells you that 9 cats were grey. You know that 6 of those also had short hair. Therefore, the number of **only grey** cats would be 9 minus 6.

Write your answer in the “Grey” circle.

- d. Find the number of cats that had **only short hair**.

The problem tells you that 10 cats had short hair. You know that 6 of those were also grey. Therefore, the number of **only short hair** cats would be 10 minus 6.

Write your answer in the “Short Hair” circle.

- e. Find the number of cats that don’t have short hair and that are not grey.

The problem tells you that Zack saw 18 cats. To find the number of cats that were not grey and that didn’t have short hair, add up the three numbers in the circles and subtract from 18.

Write your answer at the bottom inside the large box.

Check your answers in the Appendix.

For the following question, use a Venn diagram to organize the data. Then tell what patterns you can see.

7. a. Write the numbers from 1 to 15 on the lines.

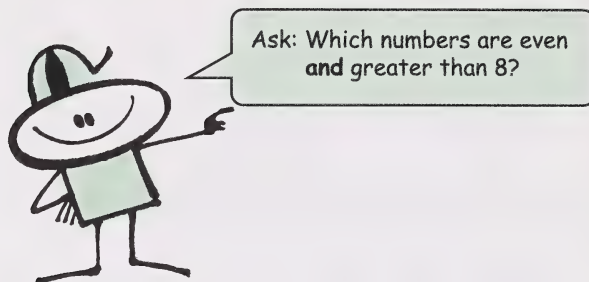
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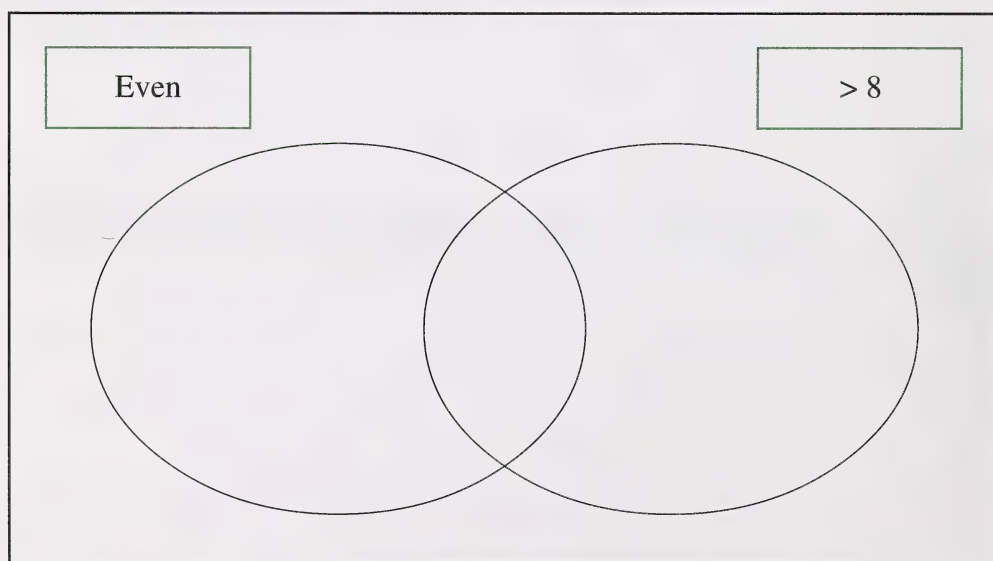


b. Sort the numbers into the correct section of the Venn diagram.

- Start by writing the numbers that fit into the overlapping section.



- Next find the numbers that are even **only**. Write them in the left circle.
- Then find the numbers that are greater than 8 **only**. Write them in the right circle.
- Put the numbers that don't belong in either circle at the bottom inside the large box.



Check your answers in the Appendix.





If you look carefully at the Venn diagram, you may notice several patterns in the way the numbers are arranged.

For example, do you notice anything about the numbers on the far left side? They are all even and all less than 8.

- 8. a.** Tell what other patterns you see in the arrangement of numbers in the Venn diagram.

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- b.** Tell where you would put the number 28. Would it go in the left circle, the right circle, or in the overlapped area? Explain why.

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Check your answers in the Appendix.

Turn to Assignment Booklet 2B, and complete the activities for Day 14.





## Using Patterns to Prove a Theory



At one time, people believed the Earth was flat. This was a **theory**, or an idea, that existed for many years. Over time, this theory was proven false.

Christopher Columbus believed the Earth was round. His theory was that, if the Earth was round, he would be able to reach Asia by sailing west from Spain. So, in 1492, he set off on a voyage to reach Asia.

The theory about the Earth being round was true, but Columbus's theory that he could reach Asia was wrong. He had assumed that the Earth was much smaller than it is, and was surprised to find that another body of land (North America) lay between Europe and Asia.

People have theories about many things. There are many theories in mathematics. In today's lesson, you will investigate **odd** and **even numbers** and write your own theories about adding numbers.

## Odd Versus Even



For this lesson you will need 50 cut-out squares or 50 square tiles. The cutouts can be found in Day 15 of the Cut-Out Learning Aids section of the Appendix.

By now you probably know that all whole numbers are either odd or even.



1. How do you know if a number is odd or even?

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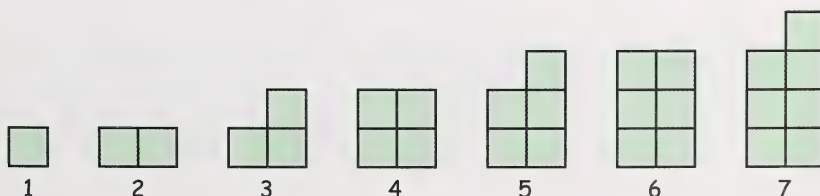
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Check your answer in the Appendix.

You can also tell if a number is odd or even by looking at its shape.

Look at the following pattern of shapes.



2. What do you notice about the pattern for the even numbers? What do you notice about the pattern for the odd numbers?

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3. Using the tiles or the cut-out squares, continue the pattern for the numbers 8 to 12. Does the pattern continue for the numbers 8 to 12 in the same way as it did for the odd and even numbers from 1 to 7? Explain.

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Check your answers in the Appendix.

4. Now try making the pattern for each of the following numbers:

15, 18, 25, 36

If you had enough squares to make all the numbers up to 1000, do you think you would find any that do not fit the pattern? Explain.

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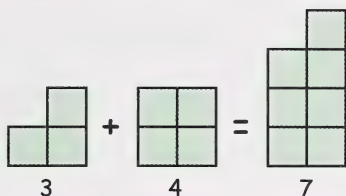
Check your answer in the Appendix.



## Adding Odd and Even Numbers



Use the square tiles or cut-out squares to show what happens when you add two numbers together.



In this example, an odd number (3) is added to an even number (4). This results in an odd number (7). Will this always be true?

Use the square shapes or tiles to decide. Add several pairs (one odd number and one even number) of numbers together using the square cutouts or tiles.

Now it's time to put into words what you know about adding odd and even numbers together. The statement you write is called a theory.

5. Based on your observations using the squares, write your theory. Tell what you believe to be true about **adding an odd number to an even number** by completing the statement. Then explain how you proved your theory is true.

Theory: When an odd number and an even number are added together...

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Check your answer in the Appendix.



6. Use the squares to experiment and prove your theory about **adding an even number to an even number**. Write your theory. Then explain how you know it is true.

Theory: When two even numbers are added together...

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7. Use the squares to experiment and prove your theory about **adding an odd number to an odd number**. Write your theory. Then explain how you know it is true.

Theory: When an odd number and an even number are added together...

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Check your answers in the Appendix.

$$\text{odd} + \text{odd} = ?$$

$$\text{even} + \text{odd} = ?$$

$$\text{even} + \text{even} = ?$$

## Calculator Patterns



You can use a calculator to discover patterns as well as to create your own patterns.

8. For each of the four questions that follow

- Use a calculator to calculate the answer on the top three lines.
- Look for a pattern and use it to fill in the bottom three lines. Do this **without** using your calculator.
- Then use your calculator to check if the numbers you wrote on the bottom three lines are correct.



a.

$$37 \times 3 = \underline{\hspace{2cm}}$$

$$37 \times 6 = \underline{\hspace{2cm}}$$

$$37 \times 9 = \underline{\hspace{2cm}}$$

$$37 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

$$37 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

$$37 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

b.

$$9 + 99 = \underline{\hspace{2cm}}$$

$$8 + 99 = \underline{\hspace{2cm}}$$

$$7 + 99 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} + 99 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} + 99 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} + 99 = \underline{\hspace{2cm}}$$

c.

$$11 \times 11 = \underline{\hspace{2cm}}$$

$$11 \times 111 = \underline{\hspace{2cm}}$$

$$11 \times 1111 = \underline{\hspace{2cm}}$$

$$11 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

$$11 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

$$11 \times \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

d.

$$64 \div 9 = \underline{\hspace{2cm}}$$

$$74 \div 9 = \underline{\hspace{2cm}}$$

$$84 \div 9 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} \div 9 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} \div 9 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} \div 9 = \underline{\hspace{2cm}}$$

9. Use a calculator to continue each of the patterns given. Then explain how the numbers change in each pattern. An example is done for you.

**Example**

1000, 2000, 3000, 4000, 5000, 6000, 7000

Add 1000.

a. 1225, 1235, 1245, 1255, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b. 17, 34, 51, 68, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c. 770, 660, 550, 440, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d. 1234, 2345, 3456, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Check your answers in the Appendix.

10. Now try creating two number patterns of your own. In the space provided, explain how the numbers change in your pattern. Use your calculator if you wish. When you are finished, cover up the explanation for Pattern 1 with a piece of paper. Ask your home instructor to look at the row of numbers and guess what the pattern is. Do the same for Pattern 2.

**Pattern 1**

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

\_\_\_\_\_



## Pattern 2

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Check your answers in the Appendix.

### Basic Number Facts Practice



In Day 12 you reviewed the multiplication facts from Grade 3. Did you forget some of the facts you thought you knew? If so, don't worry. Just keep reviewing them, and soon you should have them mastered again.

Remember to make flash cards for all the number facts that you're not sure of. Practise a few each day until you have them memorized.

So far you have seen only the addition, subtraction, and multiplication facts, but there are division number facts as well. You probably know many of the division facts already. You use division facts to help solve everyday problems.

Another way to practise both the multiplication and division facts is to write the facts out in families. Each number fact belongs to a family of two or four number facts made from the same numbers.

- $3 \times 6 = 18$  belongs to a family of four facts:

$$3 \times 6 = 18$$

$$6 \times 3 = 18$$

$$18 \div 6 = 3$$

$$18 \div 3 = 6$$

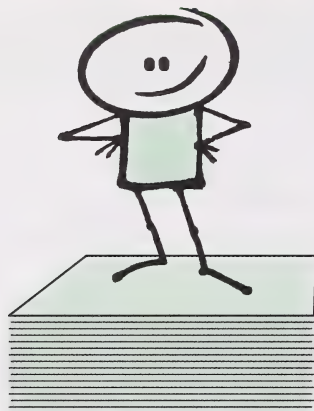
- $4 \times 4 = 16$  belongs to a family of two facts:

$$4 \times 4 = 16$$

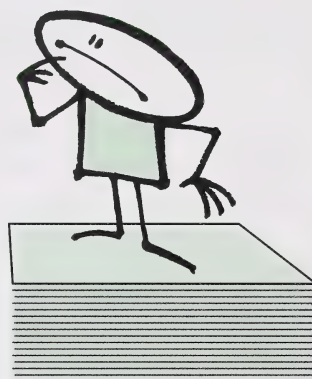
$$16 \div 4 = 4$$

Following are the division number facts you need to know. Make your own flash cards for the division facts and then separate them into two piles: those facts you already know and the ones you still need to learn.

### Facts I Already Know



### Facts To be Learned



$1 \div 1 = 1$

$2 \div 2 = 1$

$3 \div 3 = 1$

$4 \div 4 = 1$

$2 \div 1 = 2$

$4 \div 2 = 2$

$6 \div 3 = 2$

$8 \div 4 = 2$

$3 \div 1 = 3$

$6 \div 2 = 3$

$9 \div 3 = 3$

$12 \div 4 = 3$

$4 \div 1 = 4$

$8 \div 2 = 4$

$12 \div 3 = 4$

$16 \div 4 = 4$

$5 \div 1 = 5$

$10 \div 2 = 5$

$15 \div 3 = 5$

$20 \div 4 = 5$

$6 \div 1 = 6$

$12 \div 2 = 6$

$18 \div 3 = 6$

$24 \div 4 = 6$

$7 \div 1 = 7$

$14 \div 2 = 7$

$21 \div 3 = 7$

$28 \div 4 = 7$

$8 \div 1 = 8$

$16 \div 2 = 8$

$24 \div 3 = 8$

$32 \div 4 = 8$

$9 \div 1 = 9$

$18 \div 2 = 9$

$27 \div 3 = 9$

$36 \div 4 = 9$

$5 \div 5 = 1$	$6 \div 6 = 1$	$7 \div 7 = 1$	$8 \div 8 = 1$	$9 \div 9 = 1$
$10 \div 5 = 2$	$12 \div 6 = 2$	$14 \div 7 = 2$	$16 \div 8 = 2$	$18 \div 9 = 2$
$15 \div 5 = 3$	$18 \div 6 = 3$	$21 \div 7 = 3$	$24 \div 8 = 3$	$27 \div 9 = 3$
$20 \div 5 = 4$	$24 \div 6 = 4$	$28 \div 7 = 4$	$32 \div 8 = 4$	$36 \div 9 = 4$
$25 \div 5 = 5$	$30 \div 6 = 5$	$35 \div 7 = 5$	$40 \div 8 = 5$	$45 \div 9 = 5$
$30 \div 5 = 6$	$36 \div 6 = 6$	$42 \div 7 = 6$	$48 \div 8 = 6$	
$35 \div 5 = 7$	$42 \div 6 = 7$	$49 \div 7 = 7$		
$40 \div 5 = 8$	$48 \div 6 = 8$			
$45 \div 5 = 9$				



Ask your home instructor to time you as you complete the following timed exercise. Your goal is to complete all 25 questions in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the space provided at the end of the exercise. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

### Basic Number Facts Practice

#### Division Number Facts

Number Completed in 2 Minutes \_\_\_\_\_

Number Correct in 2 Minutes \_\_\_\_\_

Record your score on the Number Facts Progress Chart.

**11. Division Number Facts**  
**Timed Exercise: 2 minutes**

$36 \div 6 =$       $49 \div 7 =$       $48 \div 6 =$       $45 \div 5 =$       $32 \div 4 =$

$3 \overline{)27}$

$9 \overline{)36}$

$2 \overline{)14}$

$8 \overline{)40}$

$7 \overline{)42}$

$16 \div 2 =$       $30 \div 6 =$       $35 \div 5 =$       $28 \div 4 =$       $18 \div 3 =$

$9 \overline{)45}$

$5 \overline{)40}$

$6 \overline{)24}$

$9 \overline{)27}$

$7 \overline{)28}$

$21 \div 3 =$       $36 \div 4 =$       $18 \div 9 =$       $32 \div 8 =$       $42 \div 6 =$



Check your answers in the Appendix.

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Turn to Assignment Booklet 2B, and complete the activities for Day 15.

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## Problem Solving

In Module 1 you were introduced to the problem-solving process, and to the four-step method of problem solving. You also looked at the strategy called “Acting Out the Problem.”

A description of the various problem-solving strategies introduced in Grade 4 can be found in the Problem-Solving section of the Appendix of Module 1. You may refer to this section at any time throughout the year if you need help learning to use any of the strategies.

Today you’ll look at another problem-solving strategy.

### Problem-Solving Strategy: Guess-and-Check



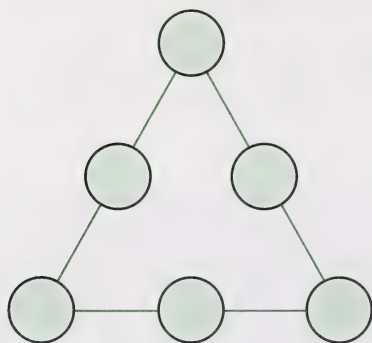
When you use the Guess-and-Check strategy, you make a reasonable guess or estimate of the answer. Then you check to see if the answer “works” to solve the problem. Sometimes your first guess will give you the correct answer. At other times, you will have to go through many guesses before you find the correct answer.

Although the strategy is called “Guess and Check,” this does not mean you should begin guessing without first thinking about what you have learned from reading the problem. Think about what was said. Think about the numbers in the problem. Try to make a “good” guess based on what you know.

For example, if a problem asks you to find two numbers that add up to 100, making a guess of 187 and 92 would not be a “good” guess. You already know that 187 is greater than 100, so it cannot be added to another number to make 100.

Use the **Guess-and-Check** strategy to solve the following problems.

### Example 1: Triangle Sums Problem



Arrange the numbers from 1 to 6 in the circles so that the sum of the three numbers along each side of the triangle is 10. In other words, each straight row of three circles must equal 10.

Follow the four-step method as you work through this problem.

#### Step 1: Understand the problem.

“I need to place the numbers from 1 to 6 in the circles. Each line must add up to 10.”

#### Step 2: Make a plan. (Choose a strategy.)

Use the Guess-and-Check strategy.

#### Step 3: Try the plan.

Before you begin writing numbers in the circles, think about what you know about the numbers 1 to 6.

1. If the three numbers you put in a row must add up to 10, would writing

$\textcircled{1} + \textcircled{2} + \textcircled{3}$  in a row be a good guess? Explain why.

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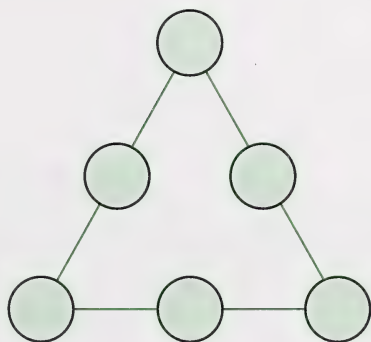
2. What three numbers in a row would be a good guess to try?



3. Think of two other combinations that add up to 10 using only the numbers 1 to 6.



4. Now that you've discovered which three numbers might be used in each row, you will need to try different ways of arranging the numbers so that each of the three lines totals 10. Do this now.

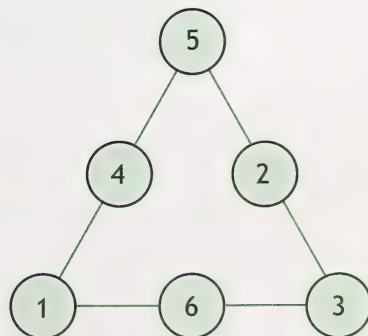


When you're done, check to see that each line totals 10.

Check your answers in the Appendix.

#### ANSWER TO THE PROBLEM:

The numbers can be arranged as shown so that each row totals 10.



#### Step 4: Look back.

After you have arrived at a solution, take a moment to look back at the problem and the method you used to solve it.

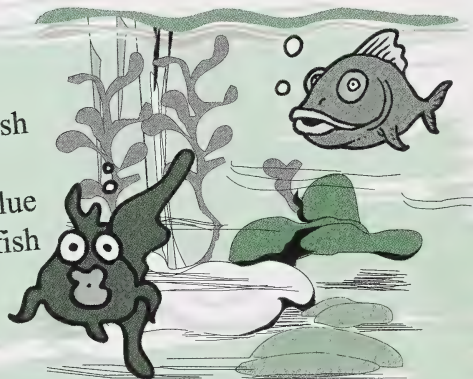
Ask yourself these questions:

- Does my solution solve the problem asked in the question? (Is the sum of each row equal to 10?)
- Does the solution make sense? (Did I use all six numbers?)
- Is there another way I could have solved this problem? (Could I have arranged the numbers differently and still have each row add up to 10?)



#### Example 2

At Paddy's Pet Parlour there is a huge fish tank filled with silver fish and blue fish. There are 436 fish altogether. There are 120 more blue fish than silver fish. How many fish of each kind are there?



Again, use the four-step method to solve this problem.

#### Step 1: Understand the problem.

“I need to find the number of each kind of fish in the tank. There are 436 fish altogether. There are 120 more blue fish than silver fish.”



## Step 2: Make a plan. (Choose a strategy.)

Use the Guess-and-Check strategy.

## Step 3: Try the Plan.

Begin with the silver fish and make a guess.

5. Suppose you guess there are 200 silver fish.

- a. How many blue fish would there be? Write your answer in the shaded box.

Silver Fish		Blue Fish
200	+	

- b. Explain how you got your answer for the number of blue fish.

---

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- c. What will be the total number of fish if you guess 200 silver fish? Write your answer in the shaded box.

Silver Fish		Blue Fish	
200	+	320	=

- d. Is the total too large or too small? \_\_\_\_\_

- e. How do you know? \_\_\_\_\_

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- f. Therefore, you know your first guess for the number of silver fish was wrong. How can you make your next guess better?

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Check your answers in the Appendix.

Since your first guess of 200 silver fish was too large, try a smaller number such as 150.

6. a. Write 150 in the first shaded box. Then calculate the number of blue fish, and find the total.

Silver Fish	+	Blue Fish	=	

- b. What do you notice about your total number of fish? Is it too large or too small? \_\_\_\_\_
- c. How can you make your next guess better?

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Check your answers in the Appendix.

Since your last guess of 150 silver fish was too small, try a larger number such as 160.

$$160 + 280 = 440 \quad (\text{This total is too large.})$$

Try a smaller guess for the number of silver fish.

$$157 + 277 = 434 \quad (\text{This total is too small.})$$

The total is almost right, but it needs to be increased slightly. Therefore, increase your guess slightly.

$$158 + 278 = 436 \quad (\text{The total is correct!})$$

7. Write your answer to the problem in a sentence.

ANSWER TO THE PROBLEM

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Check your answers in the Appendix.

#### Step 4: Look back.

Look back at your solution and ask yourself these questions:

- Did my solution answer the question asked? (Did I find the number of each kind of fish in the tank?)
- Does the solution make sense? (Do the numbers 158 and 278 sound reasonable if the total is 436?)
- Is there another way I could have solved this problem? (Could I have begun by making a guess about the number of blue fish?)

Look back at your strategy and ask yourself this question:

- Will I be able to use this strategy to solve other problems where there are two unknown numbers to find?

## Basic Number Facts Practice



Ask your home instructor to time you as you complete the following timed exercise. Your goal is to complete all 25 questions in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

### Basic Number Facts Practice

#### Multiplication Number Facts

Number Completed in 2 Minutes \_\_\_\_\_

Number Correct in 2 Minutes \_\_\_\_\_

#### Division Number Facts

Number Completed in 2 Minutes \_\_\_\_\_

Number Correct in 2 Minutes \_\_\_\_\_

Record your score on the Number Facts Progress Chart.





# 8. Multiplication Number Facts

Timed Exercise: 2 minutes

$6 \times 6 =$

$8 \times 4 =$

$9 \times 5 =$

$8 \times 6 =$

$9 \times 3 =$

$$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$$

$3 \times 7 =$

$5 \times 6 =$

$2 \times 9 =$

$7 \times 6 =$

$4 \times 8 =$

$$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$$

$4 \times 5 =$

$5 \times 8 =$

$4 \times 9 =$

$6 \times 8 =$

$5 \times 5 =$



Check your answers in the Appendix.



9. Division Number Facts

Timed Exercise: 2 minutes

$28 \div 4 =$       $40 \div 5 =$       $42 \div 6 =$       $24 \div 6 =$       $35 \div 7 =$

$9 \overline{)36}$

$5 \overline{)30}$

$6 \overline{)48}$

$3 \overline{)24}$

$9 \overline{)45}$

$18 \div 9 =$       $27 \div 3 =$       $32 \div 8 =$       $21 \div 7 =$       $36 \div 6 =$

$5 \overline{)35}$

$7 \overline{)49}$

$3 \overline{)18}$

$8 \overline{)48}$

$6 \overline{)30}$

$25 \div 5 =$       $42 \div 7 =$       $20 \div 4 =$       $27 \div 9 =$       $45 \div 5 =$



Check your answers in the Appendix.

Turn to Assignment Booklet 2B, and complete the activities for Day 16.



## Putting It All Together (II)



In Section 2 you learned why **patterns** are important in mathematics:

- You explored several types of patterns.
- You looked for patterns in number situations.
- You discovered how patterns can be used to make predictions.
- You used cutouts or tiles to show chain patterns.
- You organized number data by using T-tables.
- You investigated different ways to skip count.
- You reviewed the multiplication and division number facts.
- You practised using the guess-and-check strategy in problem solving.

You will continue to see and use patterns as you work through the remaining modules of Mathematics 4. Remember, wherever numbers are being used, patterns will be found.

• • •

Today you will show what you have learned about patterns by completing several review questions. Then you will complete a Challenge Activity. It will help you extend your thinking about how patterns are used to make predictions.

## Part 1: Reviewing the Concepts

For Part 1, you will complete the review questions for Day 17 in Assignment Booklet 2B. First, you may wish to look back through the Student Module Booklet to review the concepts covered in Section 2.

## Part 2: Challenge Activities

The Challenge Activities are designed to extend the ideas you have been learning, and encourage you to explore new ideas about patterns. In your Assignment Booklet you will find two Challenge Activities. Choose **either** Activity A **or** Activity B (or you may do both if you wish).

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Turn to Assignment Booklet 2B, and complete the review activities in Part 1. Then do one or both of the Challenge Activities in Part 2.

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## Assessing What You Know (II)

Today is the last day you will be working in Section 2: Patterns. You will complete three activities in Assignment Booklet 2B:

- Showing What You Can Do
- Basic Number Facts
- Thinking About What You Know

Read the explanation of the activities in Parts 1, 2 and 3 before turning to Assignment Booklet 2B. Note that you will need the help of your home instructor for the activities, in Parts 1 and 2.



## Part 1: Showing What You Can Do



For this activity you will need the help of your home instructor. You will be working on a short activity while your home instructor observes you. As you work through the problem, try to explain clearly what you are doing.

Your home instructor may ask you questions like the following:

- “How do you know that?”
- “Why did you decide to do that?”
- “How did you get that answer?”

Your job is to explain what you are doing so that your home instructor can understand your thinking.



### Note to the Home Instructor

This performance assessment should take about 15 minutes. The Home Instructor’s Assessment Page and accompanying Student’s Assessment Page can be found in Day 18 of Assignment Booklet 2B. Remove both pages from the Assignment Booklet. Read over the student’s page so you are familiar with the student’s assigned task. You should also preview the interview questions and the checklist before the student begins working on the assigned task.

As the student works to answer the questions, encourage him or her to talk about what he or she is doing. **Allow the student to use any manipulatives or cut-out learning aids available to help solve the problem.** You may or may not wish to use some of the interview questions. Look for understanding and the student’s ability to explain clearly what he or she is doing to arrive at an answer. Indicate on the checklist whether you feel the student demonstrated the skills being assessed.

Attach both assessment pages to the Assignment Booklet before sending it in for marking.

## Part 2: Basic Number Facts

In this activity you will show how well you are doing at learning your basic number facts for multiplication and division. Ask your home instructor to time you as you do each test.

## Part 3: Thinking About What You Know

In this activity you will spend some time looking back over Days 11 to 17 in the Student Module Booklet. Then you will complete some statements that tell about things you liked about this section of the module, things you didn't understand, and things you would like to learn more about. This information will be helpful to your teacher in determining how well you understood the information presented in the module.

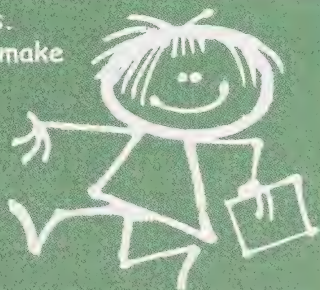
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When your home instructor is ready, turn to Assignment Booklet 2B and complete the activities found in Parts 1, 2 and 3 of Day 18.

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This is the end of Section 2: Patterns.  
Check over Assignment Booklet 2B to make  
sure you have completed all of the  
assigned activities for each day.  
Remember that for Day 17 you need  
to complete the review questions in  
Part 1 and one or both Challenge  
Activities in Part 2.



Be sure to attach the **two** assessment pages from Day 18 to  
Assignment Booklet 2B. Then send Assignment Booklet 2B to  
your teacher.







# Appendix

Glossary

Answer Key to Self-Marking Activities

Cut-Out Learning Aids

Number Facts Progress Chart



# Glossary

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**abacus:** a device used for calculation, made up of rows of beads in a frame

An abacus may also be used to illustrate place value.

**basic number facts:** the addition and subtraction number statements, usually made up of two numbers whose sum is 18 or less (for example,  $8 + 9 = 17$ ,  $17 - 9 = 8$ ); and the multiplication and division number statements made up of numbers with products up to 81 (for example,  $9 \times 5 = 45$ ,  $45 \div 5 = 9$ )

**chain pattern:** a pattern of numbers or figures in which each item is related to the number or figure that comes before it

**computation:** the act of adding, subtracting, multiplying, or dividing

**digit:** any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 used to write numbers

**estimate:** to make a careful guess that is close to the actual value without calculating the value exactly

**even number:** a whole number that can be divided by 2 without a remainder

Numbers ending in 0, 2, 4, 6, or 8 are said to be even numbers.

**expanded form:** a way of writing a number so that the place value of each digit is shown

$$823 = (8 \times 100) + (2 \times 10) + (3 \times 1) \text{ or}$$
$$823 = 800 + 20 + 3$$

**factor:** any of the numbers used to form the product of another number

The numbers 2 and 4 are factors of 8 because  $2 \times 4 = 8$ .

**figure:** a two-dimensional geometric diagram

**hexagon:** a six-sided shape

A regular hexagon has six equal sides and six equal angles.



**multiple:** the number arrived at when you multiply a given number by 1, 2, 3, 4, 5, and so on

For example, 16 is a multiple of 8 because 8 can be multiplied by 2 to arrive at 16. However, 16 is **not** a multiple of 3, 7, or 9 because none of these numbers can be multiplied by 1, 2, 3, 4, and so on to arrive at 16.

**numeral:** the written form of a number using digits

For example, the numeral for twenty-three is 23.

**odd number:** a whole number that **cannot** be divided by 2 without a remainder

Numbers ending in 1, 3, 5, 7, or 9 are said to be odd numbers.

**operation:** a mathematical process or action, such as adding, subtracting, multiplying, or dividing

**pattern:** a repeating design of colours, lines, shapes, figures, sounds, words, letters, or numbers

The arrangement usually allows you to predict how the pattern will continue.

**perimeter:** the distance around the outside edge of a shape or figure

**place-value system:** a number system in which the position of a digit tells its value

For example, in the base ten system, the 4 in 7495 means 400.

**portion:** a part of a whole

**product:** the number arrived at when two or more numbers are multiplied

For example, 18 is the product of 6 and 3.

**rounded number:** a number that is approximately equal to a given number

For example, 24 573 rounded to the nearest ten is 24 570; 24 573 rounded to the nearest hundred is 24 600; and 24 573 rounded to the nearest thousand is 25 000.

**skip counting:** counting in a pattern by omitting numbers

For example, if you skip count by 2s, you will have 2, 4, 6, 8, ...; if you skip count by 3s, you will have 3, 6, 9, 12, ...; and if you skip count by 5s, you will have 5, 10, 15, 20, ....

**theory:** an idea or statement that states something believed to be true

**T-table:** a table of data, usually having two columns

**whole numbers:** the set of numbers 0, 1, 2, 3, 4, and so on; numbers that are not made up of fractions or decimals

# Answer Key to Self-Marking Activities

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## Day 1: Numbers

1. Answers will vary. A sample answer is given.

11223344556677889900

2. a. Answers will vary. A sample answer is given.

8812 – 64 Street  
Your Town, Alberta  
A1B 2C3

- b. Answers will vary. The sample answer has 9 numbers.

3. a. Answers will vary. A sample answer is given.

(123) 555-5333

- b. Including your area code, your phone number will have 10 numbers.

4. Answers will vary. How old are you?

5. Answers will vary. A sample answer is given.

06/01/91

6. Answers will vary. You may need a family member to help you measure and weigh yourself. Sample answers are given.

- a. 152 cm  
b. 32 kg

7. Answers will vary. Sample answers are given.

- a. ABC 001



- b. You may have mentioned four of the following: catalog numbers, credit cards, bank account numbers, student identification numbers, TV channels, and radio stations.

8. The message is **NUMBERS ARE EVERYWHERE**.

9. Answers will vary. Sample answers are given.

- You may have used the TV program guide to find the channel of a program you wished to watch.
- You may have looked at a clock or watch to find out the time.
- You may have counted out something you ate for breakfast (eggs, slices of toast).
- You may have called someone on the telephone or sent a letter through the mail.

10. Answers will vary. Sample answers are given.

- a. The most likely method of adding up numbers in a chequebook is using a calculator.
- b. Estimating is the most likely method for predicting the amount of time needed to prepare a meal.
- c. Gas consumption can be calculated using pencil and paper or by using a calculator.

11. Answers will vary. A sample answer is given.

$$400 + 600 + 250 = 1250$$

12. Answers will vary. A sample answer is given.

$$985 - 156 = 829$$

**13.** Answers will vary. A sample answer is given.

$$435 \times 3 = 1305$$

**14.** Answers will vary. A sample answer is given.

$$252 \div 6 = 42$$

## Day 2: Estimating How Many

**1.** You should have checked the second sentence in each pair of sentences.

- a.** The average person has about 9000 taste buds.
- b.** Some cows can produce almost 9000 litres of milk per year.
- c.** There were more than 9000 people at the hockey game.

**2. a.** Answers will vary. A sample answer is given.

The population is **4200**.

- b.** Populations are more often estimates than actual numbers. Populations tend to change often because of births, deaths, and people moving into and out of a community.

**3. a.** Answers will vary. What did you guess? Do you think there are about 500 objects in the container?

- b.** Answers will vary. You may have counted the top layer of objects and then multiplied by how many layers you think there are. You may have guessed how many were in the bottom half of the containers and doubled that amount. You may have come up with your own way of making a “good” guess.
- c.** No, you probably will not guess the exact number. Because there are so many objects in the jar, it would be difficult to estimate and be exactly right.

**d.** Answers will vary. A sample answer is given.

I would take a small measuring cup and fill it with noodles (or whatever objects you are using). I would count the number of noodles in the cup. Then I would see how many cupfuls were in the jar.

- 4.** Answers will vary. The method you choose may depend on the supplies you have at home. You may find that using your hand or a small measuring scoop would work best.
- 5.** Answers will vary. Any small container such as a dish, glass, or soup ladle could be used.
- 6.** One way of using the portion method would be to measure out a portion of the objects into a small cup. Next, count how many objects there are in the cup. Then, multiply by the number of cupfuls of objects there are in the large container.
- 7.** Answers will vary. Did you count the number of objects in the portion you were using (hand, cup, spoon) and then find the number of portions in the large container?
- 8.** Answers will vary. Sample answers are given.
  - a.** The actual number of objects I counted is **586**.
  - b.** My revised estimate (from question 6.b.) was **530**.
  - c.** My revised estimate was 56 away from the actual number.
$$586 - 530 = 56$$
  - d.** My first estimate was 86 away from the actual number.
$$586 - 500 = 86$$
  - e.** My revised estimate was closer.

9. a. 98                      b. 89                      c. 58                      d. 67  
e. 136                      f. 68                      g. 65                      h. 99

## Day 3: Measuring and Estimation

1. Answers will vary. A sample answer is given.

My estimate: **100** pennies

2. a. A row of five pennies is about 10 cm long.

- b. If you know that a row of five pennies takes up about 10 cm, and you also know there are 100 cm in 1 m, then you can calculate how many 10-cm rows there are in 100 cm.

3. Answers will vary. A sample answer is given.

There are **50** pennies in 1 m.

4. Actual number: There are **52** pennies in 1 m.

5. Answers will vary. Most likely, your second estimate was closer to the actual number. You used measuring and the portion method to make a more accurate estimate.

6. Answers will vary. A sample answer is given.

My estimate: **150** staples

7. A better way to estimate would be to count how many staples there are in 1 cm. Then use that information to calculate how many staples there are in 10 cm.

8. There are about 200 staples in 10 cm. If you know there are about 20 staples in 1 cm, you can estimate the number of staples in 10 cm by multiplying 20 by 10.



## 9. Addition Number Facts

14	12	13	13	16
14	12	11	18	12
13	11	14	17	13
17	15	11	16	15
12	15	16	13	14

## 10. Subtraction Number Facts

7	3	7	9	9
9	6	8	9	5
5	9	7	6	8
8	7	8	7	7
8	6	6	8	5

## Taking Another Look

1. Answers will vary. Your estimate should be between 15 and 25 people.
2. Answers will vary. A sample answer is given.

One strategy is to divide the picture into sections or rows, count the number of people in one section, and then multiply the number of people in one section by the number of sections.

3. a. There are 18 people in the diagram.
- b. Answers will vary. Subtract the actual number of people from the number in your estimate.

## Day 4: Modelling Numbers

1. a. 1      b. 10      c. 10      d. 100      e. 10      f. 100
2. a. 20      b. 100

3. a. 400    b. 1000

4. Answers will vary. If you are using the cut-out models, your estimate might be about 800. If you have an actual base ten set, it may contain about 1300 ones.

5. a. 816    b. eight hundred sixteen

**Note:** This is the actual number of units using the cut-out paper models for Day 4 in the Appendix.

6. a. • 7 hundreds + 4 tens + 2 ones  
•  $700 + 40 + 2$   
• 742

b. • 3 hundreds + 8 tens + 3 ones  
•  $300 + 80 + 3$   
• 383

c. • 4 hundreds + 5 tens + 9 ones  
•  $400 + 50 + 9$   
• 459

d. • 6 hundreds + 7 tens + 8 ones  
•  $600 + 70 + 8$   
• 678

7. a. 684    b. 895    c. 447    d. 210    e. 309

8. a.  $700 + 80 + 7$

b.  $500 + 20 + 6$

c.  $900 + 0 + 3$  or  $900 + 3$

d.  $100 + 40 + 4$

e.  $800 + 60 + 0$  or  $800 + 60$

9. a. 747    b. 406    c. 200    d. 150

10. a. 243    b. 950    c. 325    d. 600    e. 415

11. a. two hundred nineteen

b. seven hundred thirty-one

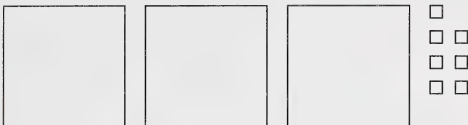
c. five hundred fifty

d. nine hundred ninety

e. four hundred forty

12. Your drawings may be arranged differently, but must include the given shapes.

a.  235


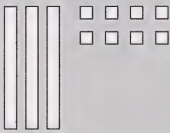

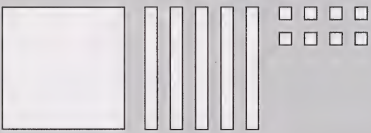
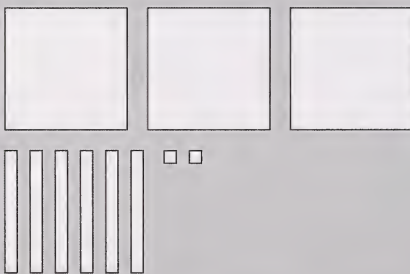
b.  307

c.  280

d.  429

13. **Quest 2000** Page 52

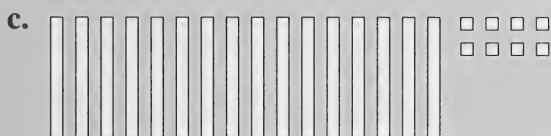
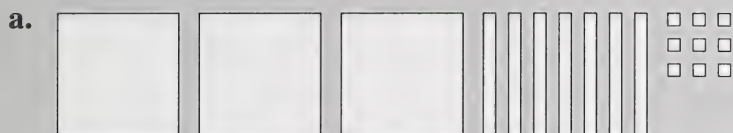
Problem Bank, Question 1:

Number You Start With	Base Ten Blocks Needed to Make 400	Number You Need to Make 400
175		225
362		38
99		301
242		158
38		362



**Quest 2000** Page 53

**Problem Bank, Question 5:**



- d. Many answers are possible. A sample answer is given.

There are 23 blocks. These blocks show 176.

**Problem Bank, Question 6:**

Many answers are possible. Sample answers are given.

- a. 150 ones **or** 150
- b. 1500 ones, 150 tens, **or** 1500
- c. 15 000 ones, 1500 tens, 150 hundreds, **or** 15 000

**Problem Bank, Question 7:**

In the first set, 796:      a. 976                      b. 679

In the second set, 4108      a. 8410                      b. 1048

In the third set, 5326      a. 6532                      b. 2356

## Day 5: Modelling Larger Numbers

1. a. 10
- b. A tens rod is **10** times as big as a unit cube.
- c. 10
- d. A hundreds flat is **10** times as big as a tens rod.
- e. Therefore, the next bigger block in the base ten set should be **10** times as big as a hundreds flat.
2. a. 1000      b. 10      c. 100
- d. Each hundreds flat is made up of 10 tens rods. If there are 10 hundreds flats, then there must be  $10 \times 10$  rods (or 100 rods) in 10 flats.

3.

### **Quest 2000** Page 38

#### **Representing Large Numbers**

- 1 thousand, 3 hundreds, 6 tens, 7 ones  
numeral: **1367**  
words: **one thousand three hundred sixty-seven**
- 2 thousands, 5 tens, 5 ones  
numeral: **2055**  
words: **two thousand fifty-five**
- 1 thousand, 8 hundreds  
numeral: **1800**  
words: **one thousand eight hundred**
- 3 thousands, 2 hundreds, 9 ones  
numeral: **3209**  
words: **three thousand two hundred nine**

You may wish to practise more numbers with your home instructor.

4. a. To model this number you would use thousands cubes, tens rods, and unit cubes. You would not use any **hundreds flats**.
- b. To show that there are no hundreds in the number, you write a **zero** in the hundreds place.
- c. You would use two zeros to write the numeral 1080. The base ten blocks used would be 1 thousands cube and 8 tens rods. No hundreds flats and no unit cubes are needed. Two zeros are used in the number to show that there are no hundreds and no ones.
5. Many answers are possible.

Did you find that the cube you constructed seemed to show 1000 more clearly to you? You could see all sides of the cube. You were also able to hold the cube in your hand and see the actual size.

6. a. • 2 thousands + 3 hundreds + 4 tens + 0 ones  
•  $2000 + 300 + 40 + 0$   
• 2340
- b. • 4 thousands + 4 hundreds + 3 tens + 5 ones  
•  $4000 + 400 + 30 + 5$   
• 4435
- c. • 6 thousands + 2 hundreds + 4 tens + 5 ones  
•  $6000 + 200 + 40 + 5$   
• 6245
- d. • 3 thousands + 1 hundreds + 0 tens + 6 ones  
•  $3000 + 100 + 0 + 6$   
• 3106
7. a. 100                      b. 40  
c. 7000                    d. 3000  
e. 800

8. a.  $2000 + 0 + 30 + 5$  or  $2000 + 30 + 5$   
 c.  $1000 + 0 + 0 + 3$  or  $1000 + 3$   
 e.  $9000 + 900 + 50 + 7$

- b.  $6000 + 900 + 20 + 4$   
 d.  $5000 + 500 + 50 + 5$   
 f.  $3000 + 0 + 0 + 0$  or  $3000$

9. a. 3415                      b. 6042  
 c. 760                        d. 1031

10. a. 2505                    b. 500  
 c. 1030                    d. 3912  
 e. 7799

11. Lucie's set of base ten blocks stands for the number 459.

12. a.

Th	H	T	O
1	2	13	4
1	3	3	4

13 tens = 1 hundred + 3 tens

Number 1334

b.

Th	H	T	O
2	1	15	7
2	2	5	7

15 tens = 1 hundred + 5 tens

Number 2257

c.

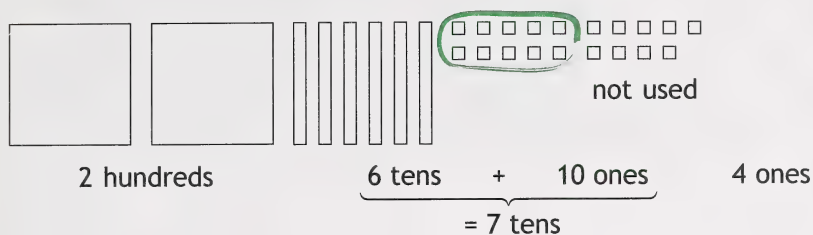
Th	H	T	O
1	4	19	35
1	4	22	5
1	6	2	5

35 ones = 3 tens + 5 ones  
 22 tens = 2 hundreds + 2 tens

Number 1625

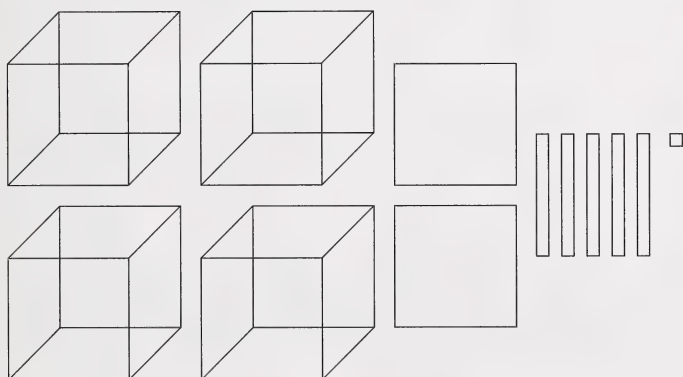


13. a. Yes. If you group 10 unit cubes to make a tens rod, you would have enough hundreds flats, tens rods, and unit cubes to show 274 (9 unit cubes would not be used).

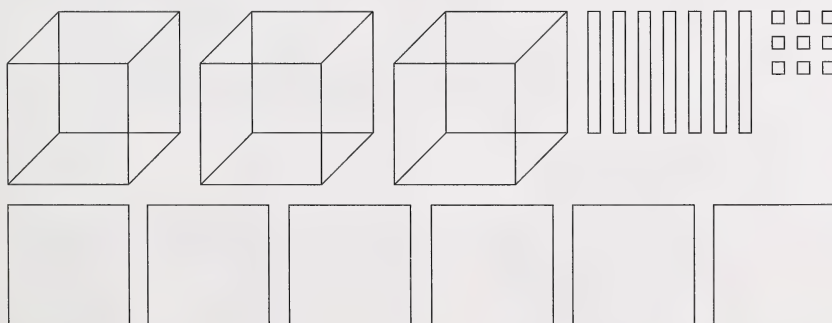


- b. No. Since the hundreds flats cannot be broken apart, you would have no way of showing the 9 tens in 196. There are not enough unit cubes to group together to make three more tens rods. Only 2 tens could be made from the unit cubes.

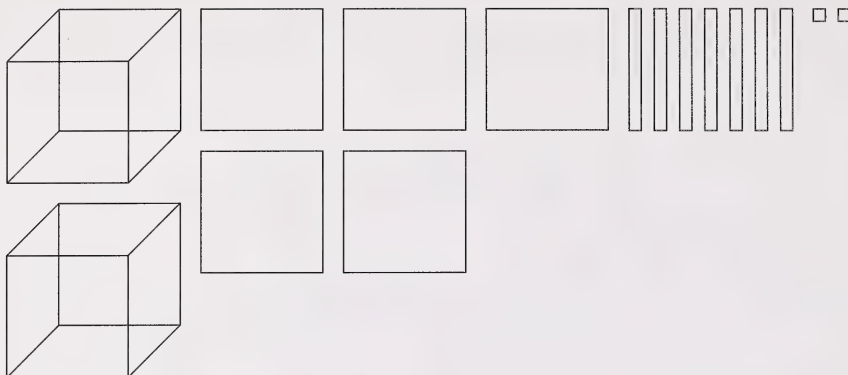
14. a.



b.



c.



Number 2572

**Problem Bank, Question 2:**

- a. The number could be any number between 410 and 419. If you chose 415, for example, the base ten drawing would be the following:



- b. The number could be any number between 800 and 809. If you chose 807, for example, the base ten drawing would be the following:



- c. The number can only be 290.



- d. The number could be 606, 624, 642, or 660. If you chose 642, for example, the base ten drawing would be the following:



## Day 6: Place Value—Whole Numbers

1. Answers will vary. You should have any five of the combinations shown in the following chart. The chart shows **all** of the possible answers.

Number of \$1 Coins	Number of 10¢ Coins	Number of 1¢ Coins	Total Number of Coins
2	1	20	23
2	0	30	32
1	13	0	14
1	12	10	23
1	11	20	32
1	10	30	41
1	9	40	50
1	8	50	59
1	7	60	68
1	6	70	77
1	5	80	86
1	4	90	95



2. Answers will vary. The following chart shows **all** possible answers.

Example:

Thousands 1	Hundreds 5	Tens 3	Ones 0
1	4	13	0
1	3	23	0
1	2	33	0
1	1	43	0
1	0	53	0
0	15	3	0
0	14	13	0
0	13	23	0
0	12	33	0
0	11	43	0
0	10	53	0
0	9	63	0
0	8	73	0
0	7	83	0
0	6	93	0
0	5	103	0
0	4	113	0
0	3	123	0
0	2	133	0
0	1	143	0
0	0	153	0

3. a. Ones  
b. Hundreds  
c. Thousands

4. a. **Tens** are 10 times greater than ones.  
b. Hundreds are 10 times greater than **tens**.  
c. **Thousands** are 10 times greater than hundreds.

5. a. 10 times greater  
b. Ten thousands

6. a. 3065                      b. 7916                      c. 10 508                      d. 2202                      e. 4050

7. a. 2632                      b. 10 305  
c. 14 031                      d. 11 410

8. a. The pattern in the chart is cube, rod, flat, cube, ....  
b. Did you predict a rod shape? If you did, you are correct!

9. a. 10                              b. 10  
c. 100                              d. 10 000

# 10. Addition Number Facts

13	17	14	16	15
14	15	18	12	13
13	12	15	13	11
14	16	11	14	14
15	13	16	13	17

# 11. Subtraction Number Facts

7	6	9	9	8
5	9	6	4	9
5	8	7	8	6
8	4	9	7	9
8	4	7	7	5

## Day 7: Comparing Whole Numbers

1. a. 3578  
b. 8753

- c. Answers will vary. These are the other possible four-digit numbers; they are listed from least to greatest in each column:

3587	5378	7358	8357
3758	5387	7385	8375
3785	5738	7538	8537
3857	5783	7583	8573
3875	5837	7835	8735
	5873	7853	

2. In order to put five numbers with the same digits in order from least to greatest, it is necessary to compare the digits that are in the same place-value column. Begin at the place-value column furthest to the left (the thousands) and compare.

For example, 5783 is smaller than 7583 because

- there is a 7 in the thousands column of 7583
- there is only a 5 in the thousands column of 5783

If the digit in that place-value column is the same for both numbers, then it's necessary to move right to the next place-value column (the hundreds) to compare.

For example, 7358 is smaller than 7538 because

- both numbers have 7 thousands
- there are 5 hundreds in 7538
- there are only 3 hundreds in 7358

3. a. 80                      b. 8000                      c. 8  
d. 800                      e. 80                      f. 800

4. a. 2798      b. 3105      c. 10 052  
 d. 6007      e. 1243      f. 3057  
 g. 2011      h. 6606      i. 8181

5. a. 328

b. Yes, 328 is the greatest.

c. No, since both 238 and 283 have two hundreds, the hundreds column doesn't show which number is the next greatest.

6. a. 283

b. Yes, 283 is the next greatest number.

c. 238 is the least number.

7. 328 greatest

283

238 least

8. a. No, because all 3 numbers have 4 hundreds.

b. You can tell that 426 is the least number.

c. You should have put an 'L' beside 426.

d. No

e. 435 is greater.

9. 435      432      426  
 greatest      least

10. a.  $5483 > 5438$

d.  $2102 < 2120$

b.  $6686 < 6866$

e.  $2929 < 9229$

c.  $4363 > 4336$

f.  $9769 > 9697$

11. a. 491, 914, 941

b. 149, 194, 419, 491



12. a. 8222, 8232, 8233, 8332  
b. 2224, 2243, 3234, 3423  
c. 5565, 5656, 6556, 6566

### Taking Another Look

1. a. 3247      b. 5029      c. 7456      d. 2903      e. 1870

2. a.  $3000 + 300 + 40 + 3 = 3343$   
b.  $6862 = 6000 + 800 + 60 + 2$   
c.  $7000 + 600 + 0 + 9 = 7609$   
d.  $4424 = 4000 + 400 + 20 + 4$   
e.  $5081 = 5000 + 80 + 1$

3. a. 900 or 9 hundreds      b. 70 or 7 tens  
c. 0 or 0 ones      d. 8000 or 8 thousands

4. a.  $6748 > 4678$       b.  $3434 > 3344$   
c.  $4120 < 4201$       d.  $9898 > 9889$   
e.  $7557 < 7755$

5. a. 2939, 3905, 4572, 7238  
b. 1234, 2134, 2314, 2431  
c. 6667, 6676, 6767, 6776  
d. 1001, 1010, 1100, 1101

## Day 8: Rounding Whole Numbers

1. a. 5937      6000  
b. 2846      3000  
c. 6941      7000  
d. 2329      2000  
e. 5184      5000  
f. 3697      4000

2. a. 2000                      b. 3000                      c. 10 000  
      d. 6000                      e. 8000                      f. 6000
3. a. 1400                      b. 6600                      c. 5000  
      d. 9700                      e. 5100                      f. 8400
4. a. 3870                      b. 6510                      c. 4850  
      d. 7500                      e. 2020                      f. 3100
5. a. eight hundred seventy                      b. one thousand  
      c. six hundred                                      d. two hundred  
      e. one hundred eighty

6. a. 
$$\frac{\$65}{\text{total amount}} \qquad \frac{\$70}{\text{rounded amount}}$$

b. 
$$\frac{\$258}{\text{total amount}} \qquad \frac{\$260}{\text{rounded amount}}$$

c. 
$$\frac{\$94}{\text{total amount}} \qquad \frac{\$90}{\text{rounded amount}}$$

7. a. 
$$\frac{\$315}{\text{total amount}} \qquad \frac{\$300}{\text{rounded amount}}$$

b. 
$$\frac{\$155}{\text{total amount}} \qquad \frac{\$200}{\text{rounded amount}}$$

c. 
$$\frac{\$1390}{\text{total amount}} \qquad \frac{\$1400}{\text{rounded amount}}$$

## Taking Another Look

### Quest 2000 Page 54

#### Skill Bank, Question 1:

556

#### Skill Bank, Question 2:

- a. 4218      b. 680      c. 2056      d. 10 790

#### Skill Bank, Question 3:

- a. nine thousand four hundred sixty-five  
b. four thousand sixty-three

#### Skill Bank, Question 4:

- a. 1240 or one thousand two hundred forty  
b. 3240 or three thousand two hundred forty

#### Skill Bank, Question 5:

a, c, d, f

#### Skill Bank, Question 6:

- a. 784      b. 4330      c. 9879

## Day 9: Putting It All Together

All activities are to be done in Assignment Booklet 2A. This work will be marked by your teacher.

## Day 10: Assessing What You Know

All activities are to be done in Assignment Booklet 2A. This work will be marked by your teacher.

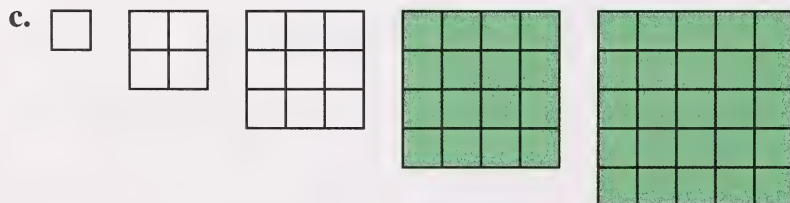
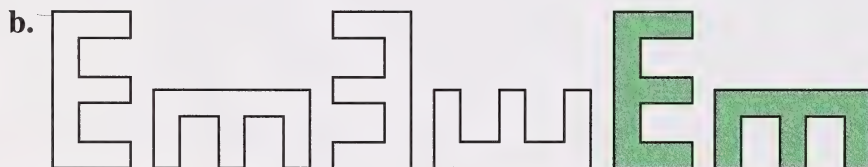
## Day 11: Patterns

1. Answers will vary. Here are several patterns that you might have seen or heard:

- quilts
- clock ticking
- colours of flowers along a path
- sidewalk blocks
- stripes on a cat
- bird calls
- lines on a piece of paper
- tree rings on a log

2. a. red, red, **red**, green, green, yellow, yellow, yellow, blue, blue, red, red, red

b. blue, red, red, **red**, green, green, yellow, yellow, yellow, blue





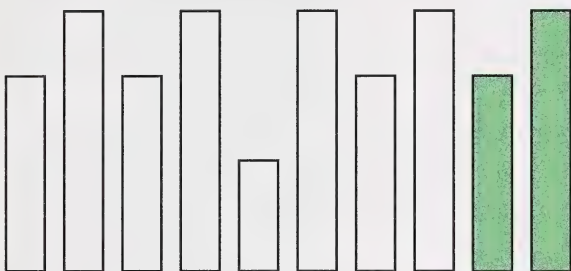
4. a.



b.



c.



5. a. clap, clap, snap, clap, clap, **snap, clap, clap**

b. ti, ti, ta, ta, ta, ti, ti, ta, **ta, ta, ti**

c. boom, click, boom, click, click, boom, click, boom, **click, click, boom**

6. a. 6, 12, 18, 24, **30, 36, 42**

pattern: **Add 6.**







b. 1, 10, 100, **1000, 10 000, 100 000**

pattern: **Multiply by 10.**

c. 951, 901, 851, **801, 751, 701**

pattern: **Subtract 50.**

7.

	Number of Tricycles	Number of Wheels
		3
		6
a.		9
b.		12
c.		15
d.		18

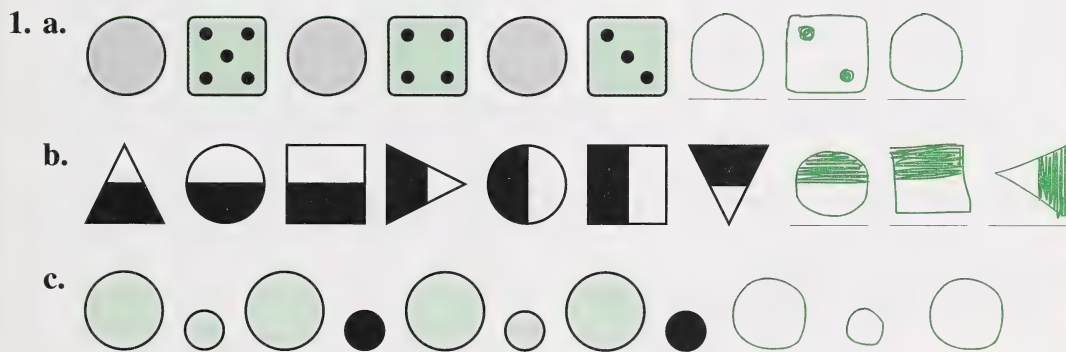
8. a. 21 wheels  
b. 30 wheels  
c. 75 wheels

9.

T	W
0	0
1	3
2	6
3	9
4	12
5	15
6	18
7	21
8	24
9	27
10	30

10. You may have discovered the pattern in the T-table. If you did, your answer will be **32** sections.
11. The number of sections doubles each time you make one more fold.
12. Was your prediction correct? Did you predict the number of sections would double from 16 to 32 after the fifth fold?
13. a. After making a sixth fold, there would be 64 sections.
- b. The number of sections doubles from the previous number of sections each time you make one more fold. After five folds, there were 32 sections. Therefore, after six folds, there would be  $2 \times 32$  sections, or 64 sections.

### Taking Another Look



2. a. 736, 836, 936, **1036**, **1136**, **1236**, **1336**  
 b. 6455, 6355, 6255, **6155**, **6055**, **5955**, **5855**  
 c. 8875, 8865, 8855, **8845**, **8835**, **8825**, **8815**  
 d. 2041, 2141, 2241, **2341**, **2441**, **2541**, **2641**  
 e. 3717, 3727, 3737, **3747**, **3757**, **3767**, **3777**

## Day 12: Skip Counting

1.
  - a. counting by 2s  
2, 4, 6, 8, 10, **12, 14, 16, 18, 20, 22, 24, 26, 28, 30**
  - b. counting by 3s  
3, 6, 9, 12, **15, 18, 21, 24, 27, 30**
  - c. counting by 5s  
5, **10, 15, 20, 25, 30, 35, 40, 45, 50**
  - d. counting by 10s  
**10, 20, 30, 40, 50, 60, 70, 80, 90, 100**
2. 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70
3. 120, 125, 130, 135, 140, 145, 150
4. 3060, 3070, 3080, 3090, 3100, 3110, 3120, 3130, 3140, 3150, 3160
5. 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000
6.
  - a. counting backwards by 2  
30, 28, 26, **24, 22, 20, 18, 16, 14, 12**
  - b. counting backwards by 100  
1500, 1400, **1300, 1200, 1100, 1000, 900, 800, 700**
  - c. counting backwards by 3  
230, 227, 224, **221, 218, 215, 212, 209, 206, 203**
  - d. counting backwards by 1000  
10 000, **9000, 8000, 7000, 6000, 5000, 4000**
  - e. counting backwards by 5  
**95, 90, 85, 80, 75, 70, 65, 60**



f. counting backwards by 8

72, 64, 56, **48**, 40, **32**, 24, **16**, 8

g. counting backwards by 10

220, **210**, **200**, 190, 180, **170**, 160, **150**

7. a. \$14 Skip count by 2s.

b. 45¢ Skip count by 5s.

c. 120¢ or \$1.20 Skip count by 10s.

8. a.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

b. You should have created a pattern in which every other column is shaded in. All the shaded numbers are even; they end in 0, 2, 4, 6, or 8.

9.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

10. a.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

b.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

11. a.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

b.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

c.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

d.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

12. a.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

b.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

c.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

13.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

14. a. The “Skip Counting by 3s” pattern and the “Multiples of 3” pattern are similar. Both charts have every third number shaded.

b. When you skip count by 3, you are identifying the multiples of 3. For example,

- The second number counted is 6; 6 is a *multiple* of 3 because 3 can be *multiplied* by another number (2) to get 6.
- The fifth number counted is 15; 15 is a *multiple* of 3 because 3 can be *multiplied* by another number (5) to get 15.



## 15. Multiplication Number Facts

42	40	21	45	6
27	18	0	49	36
16	30	32	36	40
48	28	48	18	12
36	24	0	25	35

## Taking Another Look

### 1. a. Skip counting by 2s

6, 8, 10, 12, 14, **16, 18, 20, 22, 24**

### b. Skip counting by 5s

35, 40, 45, 50, 55, **60, 65, 70, 75, 80**

### c. Skip counting by 3s

1, 4, 7, 10, 13, **16, 19, 22, 25, 28**

### d. Skip counting by 10s

445, 435, 425, 415, 405, **395, 385, 375, 365, 355**

### e. Skip counting by 10s

943, 953, 963, 973, 983, **993, 1003, 1013, 1023, 1033**

### 2. a. 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24

#### b. 0, 4, 8, 12, 16, 20, 24, 28, 32

#### c. 0, 7, 14, 21, 28, 35, 42, 49, 56, 63

### 3. a. 16, 26, 36, 46, 56, 66, 76, 86, 96

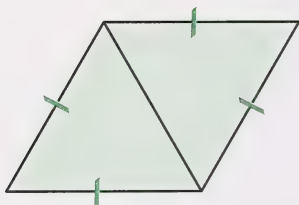
#### b. 20, 25, 30, 35, 40, 45, 50, 55, 60, 65

#### c. 9, 12, 15, 18, 21, 24, 27, 30

## Day 13: Discovering Patterns Using T-Tables

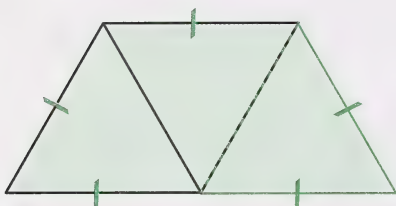
1. 3 people

2. a.



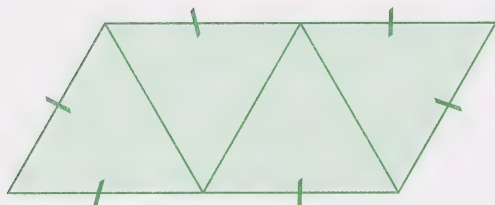
b. 4 people

3. a.



b. 5 people

4. a.



b. 6 people

5. a.

Number of Tables	Number of People Seated
1	3
2	4
3	5
4	6
5	7
6	8

b. 7 people

c. 8 people

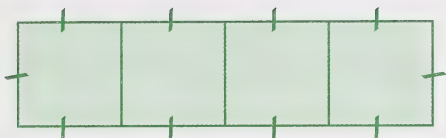
d. 17 people

e. To find the number of people who can be seated, add 2 to the number of tables.

### Example

The number of people that can be seated at 10 tables is  $10 + 2 = 12$ .

6. a.

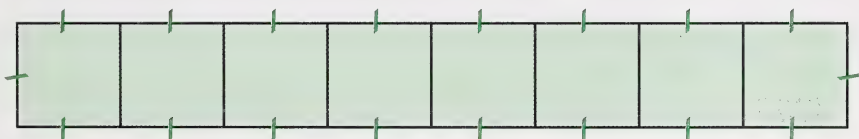


b. 10 people

c. You may have discovered two things:

- Each time you add a table, the number of people seated increases by 2.
- The number of people who can be seated is found by multiplying the number of tables by 2, then adding 2.

7.



To find the number of people who can be seated at 8 tables, use Method 1 or Method 2.

### Method 1

Multiply the number of tables by 2, and add 2.

$$8 \times 2 = 16$$

$$16 + 2 = 18$$

**OR**

## Method 2

Each time you add a table, the number of seats increases by 2.

Tables	People
3	8
4	10
5	12
6	14
7	16
8	18

18 people can be seated when 8 tables are placed in a row.

8. 5 toothpicks

9. 7 toothpicks

10. a.

Number of Triangles	Number of Toothpicks
1	3
2	5
3	7
4	9
5	11
6	13

b. You may have discovered two things:

- Each time the number of triangles increases by 1, the number of toothpicks increases by 2.
- The number of toothpicks is found by multiplying the number of triangles by 2, then adding 1.



11. There are three ways to solve this question.

**Method 1: Adding onto the T-Table**

To find the number of toothpicks needed for 10 triangles, add 2 to the number of toothpicks needed for 9 triangles.

Number of Triangles	Number of Toothpicks
6	13
7	15
8	17
9	19
10	21

You need **21** toothpicks for 10 triangles.

**Method 2: Discovering the Pattern in the T-Table**

If you look at the T-table, you will see that the number of toothpicks is always 2 times the number of triangles plus 1. To find the number of toothpicks needed for 10 triangles, you would do the following calculation.

First, multiply the number of triangles by 2.

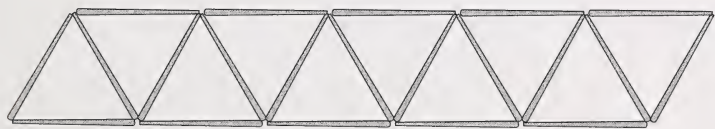
$$10 \times 2 = 20$$

Then, add 1.

$$20 + 1 = 21$$

You need **21** toothpicks for 10 triangles.

**Method 3: Making a Model**



You need **21** toothpicks for 10 triangles.

12. a.

First Number	Second Number
7	9
8	10
9	11
10	12
11	13

Pattern: **Add 2 to the first number.**

b.

First Number	Second Number
2	4
3	9
4	16
5	25
6	36
7	49

Pattern: **Multiply the first number by itself.**

c.

Number of Cows	Number of Legs
6	24
7	28
10	40
11	44
12	48

Pattern: **Multiply the number of cows by 4.**

d.

First Number	Second Number
21	10
41	30
71	60
91	80
101	90

Pattern: **Subtract 11 from the first number.**

e.

Number of Dollar Coins	Number of Dimes
1	10
2	20
3	30
5	50
9	90

Pattern: **Multiply the number of dollar coins by 10.**

## Taking Another Look

1.

First Number	Second Number
1	5
2	10
3	15
4	20
5	25
10	50
20	100

Rule: **Multiply the first number by 5.**

2.

First Number	Second Number
2	5
3	6
6	9
7	10
9	12
27	30
72	75

Rule: **Add 3 to the first number.**

3.

First Number	Second Number
2	4
3	5
7	9
14	16
39	41
101	103
282	284

Rule: **Add 2 to the first number.**

4.

First Number	Second Number
5	0
6	1
10	5
20	15
29	24
89	84
145	141

Rule: **Subtract 5 from the first number.**

## Day 14: Finding Patterns in Data

1. a., b., and c.

	Blue Hats	Red Hats
Boys	Brent      Brian Bart      Bradley Barry	Ralph      Ron Randy
Girls	Bonnie Beth	Roxanne      Rose Rita      Renée Rachel

2. a. Children wearing blue hats: 7  
b. Girls wearing red hats: 5  
c. There are more boys wearing red hats than girls wearing blue hats.
3. Every child whose name starts with the letter **B** is wearing a blue hat. Every child whose name starts with the letter **R** is wearing a red hat.
4. a. Betty      **Blue**  
Roy      **Red**
- b. He would have a boy's name starting with the letter **B**, such as Bill, Bob, or Ben.
5. a. 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100



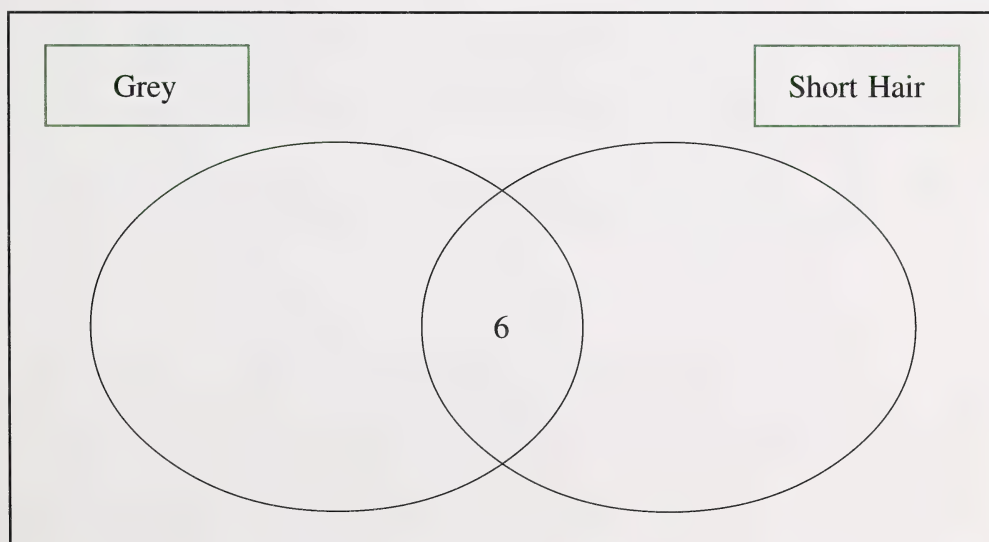
b.

	Less Than or Equal to 50	Greater Than 50
Odd	5      15      25 35      45	55      65 75      85 95
Even	10      20      30 40      50	60      70 80      90 100

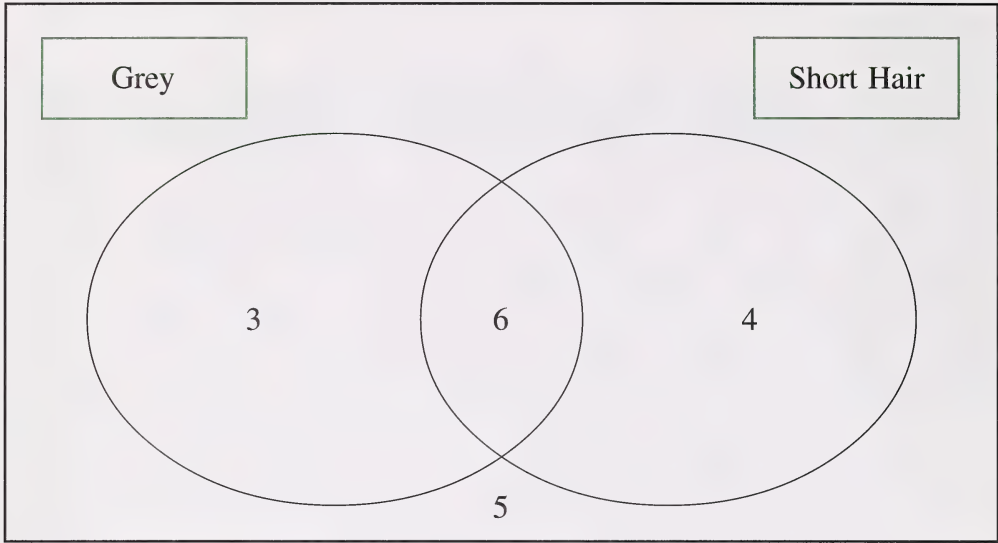
c. Several answers are possible. You may have noticed these patterns:

- The multiples of 10 appear in the bottom half.
- All the numbers in the bottom half are even.
- The multiples of 5 appear in the top half.
- All the numbers in the top half are odd.

6. a. and b.

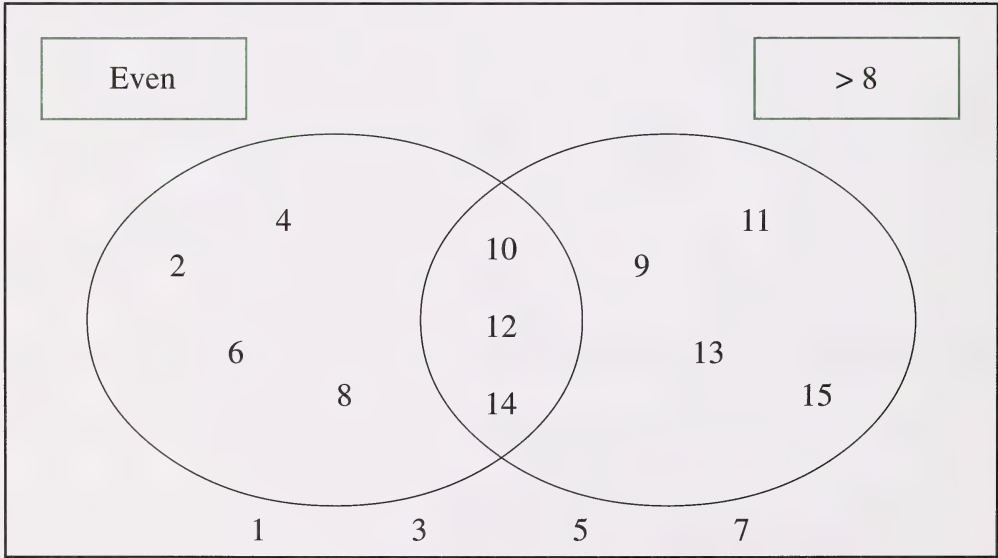


c., d., e.



7. a. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

b.



8. a. Several answers are possible. You may have noticed these patterns:

- The numbers on the far right are all odd and greater than 8.
- The numbers in the overlap section are all even and greater than 8.
- The numbers at the bottom are all odd and less than 8.

b. The number 28 would go in the overlap space because it is even and greater than 8.

## Day 15: Using Patterns to Prove a Theory

1. Even numbers end in 0, 2, 4, 6, or 8. Even numbers can be divided by 2 without a remainder. Odd numbers end in 1, 3, 5, 7, or 9. When divided by 2, odd numbers always have a remainder of 1.

2. You may have noticed the following:

- The even numbers always have two squares side by side on the top layer. (They have no remainder when divided by 2.)
- The odd numbers always have a single square on the top layer. (They have a remainder of 1 when divided by 2.)

3. Yes, the pattern continues the same way for the numbers 8 to 12. The numbers 8, 10, and 12 are even numbers, and they have two squares side by side on the top layer. The numbers 9 and 11 are odd numbers, and they have a single square on the top layer.

4. No. All numbers are either even or odd. So, all numbers up to 1000 and beyond will fit either the pattern for even numbers or the pattern for odd numbers.

## 5. Odd + Even = Odd

Theory: When an odd and an even number are added together, the result will always be an odd number. You can prove this by adding several *odd + even* pairs of numbers.

$$3 + 4 = 7$$

$$8 + 7 = 15$$

$$13 + 8 = 21$$

$$6 + 11 = 17$$

$$25 + 10 = 35$$

$$34 + 5 = 39$$

In each case, when an odd number is added to an even number, the result is always an odd number.

## 6. Even + Even = Even

Theory: When two even numbers are added together, the result will always be an even number. You can prove this by adding several *even + even* pairs of numbers.

$$8 + 8 = 16$$

$$6 + 4 = 10$$

$$4 + 18 = 22$$

$$10 + 6 = 16$$

$$12 + 12 = 24$$

$$16 + 24 = 40$$

In each case, when an even number is added to an even number, the result is always an even number.

## 7. Odd + Odd = Even

Theory: When two odd numbers are added together, the result will always be an even number. You can prove this by adding several *odd + odd* pairs of numbers.

$$3 + 5 = 8$$

$$5 + 7 = 12$$

$$7 + 9 = 16$$

$$9 + 9 = 18$$

$$11 + 13 = 24$$

$$21 + 31 = 52$$

In each case, when an odd number is added to an odd number, the result is always an even number.



8. a.  $37 \times 3 = 111$

$37 \times 6 = 222$

$37 \times 9 = 333$

$37 \times 12 = 444$

$37 \times 15 = 555$

$37 \times 18 = 666$

b.  $9 + 99 = 108$

$8 + 99 = 107$

$7 + 99 = 106$

$6 + 99 = 105$

$5 + 99 = 104$

$4 + 99 = 103$

c.  $11 \times 11 = 121$

$11 \times 111 = 1221$

$11 \times 1111 = 12\ 221$

$11 \times 11\ 111 = 122\ 221$

$11 \times 111\ 111 = 1\ 222\ 221$

$11 \times 1\ 111\ 111 = 12\ 222\ 221$

d.  $64 \div 9 = 7.111\ 111\ 1$

$74 \div 9 = 8.222\ 222\ 2$

$84 \div 9 = 9.333\ 333\ 3$

$94 \div 9 = 10.444\ 444$

$104 \div 9 = 11.555\ 555$

$114 \div 9 = 12.666\ 666$

9. a. 1225, 1235, 1245, 1255, 1265, 1275, 1285

Add 10.

b. 17, 34, 51, 68, 85, 102, 119

Add 17.

c. 770, 660, 550, 440, 330, 220, 110

Subtract 110.

d. 1234, 2345, 3456, 4567, 5678, 6789

Add 1111.

10. Answers will vary. Was your home instructor able to guess your number patterns?  
Here are two possible patterns:

- **Pattern 1**

1000, 1005, 1010, 1015, 1020, 1025, 1030

Add 5.

- **Pattern 2**

1000, 995, 990, 985, 980, 975, 970

Subtract 5.

11. Division Number Facts

6	7	8	9	8
9	4	7	5	6
8	5	7	7	6
5	8	4	3	4
7	9	2	4	7

## Day 16: Problem Solving

1. No,  $\textcircled{1} + \textcircled{2} + \textcircled{3}$  would not be a good guess because these three numbers only total 6.

2. A better guess would be to think of three different numbers that total 10. Possible combinations are as follows:

$$(5) + (4) + (1)$$

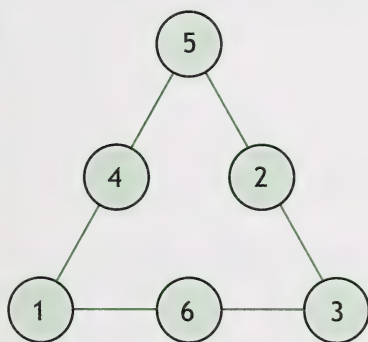
$$(1) + (3) + (6)$$

$$(2) + (3) + (5)$$

**Note:** Each combination may be written in a different order.

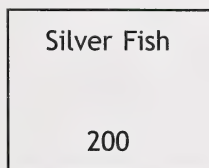
3. Check your two other combinations with those given in the answer to question 2. Remember that each combination may be written in a different order.

4.

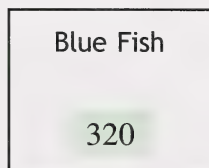


Your answer may not be exactly the same. Check to see that the numbers 5, 3, and 1 are at the “points” of the triangle and that the numbers 2, 4, and 6 are the “middle” numbers in each row.

5. a.



+



- b. Whatever guess you make for the number of silver fish, you know the number of blue fish will be 120 greater.

$$200 + 120 = 320$$

c.

Silver Fish
200

+

Blue Fish
320

=
520

d. The total is too large.

e. You know the total is too large because the problem states there is a total of 436 fish in the tank.

f. In order to make the total number of fish smaller, you need to make your guess for the number of silver fish smaller.

6. a.

Silver Fish
150

+

Blue Fish
270

=
420

b. The total number of fish is too small.

c. Your next guess for the number of silver fish needs to be a little bit larger.

7. ANSWER TO THE PROBLEM: There are 158 silver fish and 278 blue fish in the fish tank.

## 8. Multiplication Number Facts

36	32	45	48	27
35	40	12	36	24
21	30	18	42	32
28	24	49	18	45
20	40	36	48	25



9. Division Number Facts

7	8	7	4	5
4	6	8	8	5
2	9	4	3	6
7	7	6	6	5
5	6	5	3	9

Day 17: Putting It All Together

All activities are to be done in Assignment Booklet 2B. This work will be marked by your teacher.

Day 18: Assessing What You Know

All activities are to be done in Assignment Booklet 2B. This work will be marked by your teacher.

Credits

Some clip art drawings are commercially owned.

Introductory Pages

Basic Number Facts: EyeWire, Inc.  
Computers: PhotoDisc, Inc. 2000  
Journal Writing: PhotoDisc, Inc. 2000

Page

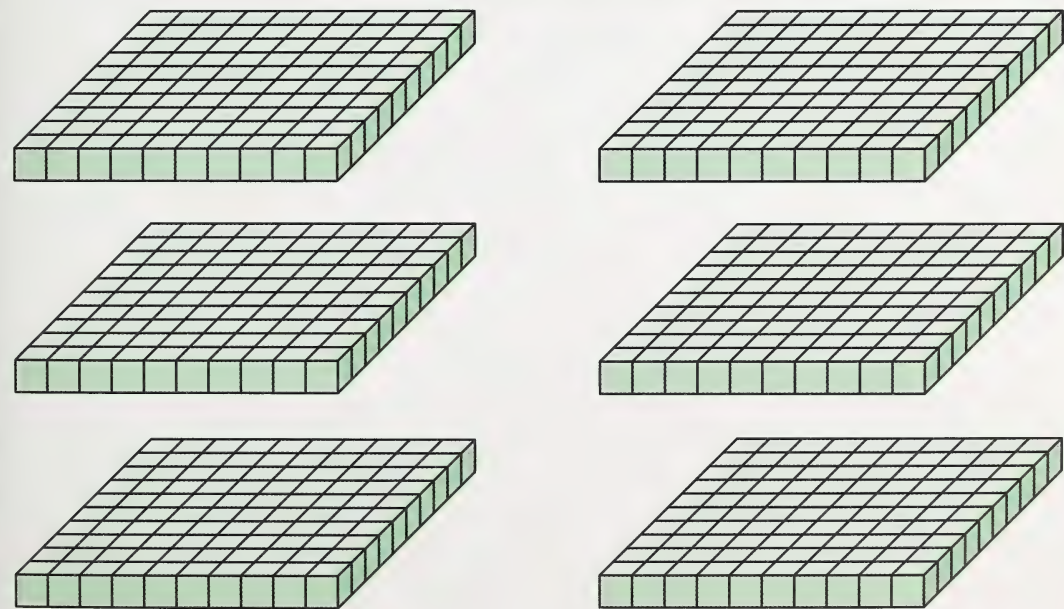
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3 PhotoDisc, Inc. 2000  
4 PhotoDisc, Inc. 2000  
10 EyeWire, Inc.  
12 PhotoDisc, Inc. 2000  
14 Corel Corporation  
19 PhotoDisc, Inc. 2000  
27 PhotoDisc, Inc. 2000

28 PhotoDisc, Inc. 2000  
71 EyeWire, Inc.  
97 PhotoDisc, Inc. 2000  
98 Corel Corporation  
109 PhotoDisc, Inc. 2000  
111 PhotoDisc, Inc. 2000  
115 Corel Corporation  
116 PhotoDisc, Inc. 2000  
117 Corel Corporation  
118 Corel Corporation (all)  
119 PhotoDisc, Inc. 2000  
163 RubberBall Productions/EyeWire, Inc.  
167 EyeWire, Inc.  
193 Corel Corporation  
195 EyeWire, Inc.



# Cut-Out Learning Aids

## Day 4: 3-D Base Ten Blocks







Day 4: Base Ten Mat #1

**Hundreds (100)**

**Tens**

↑ (Glue or tape second page here) ↑

**BASE TEN**



Day 4: Base Ten Mat #1 (continued)

**Tens (10)**

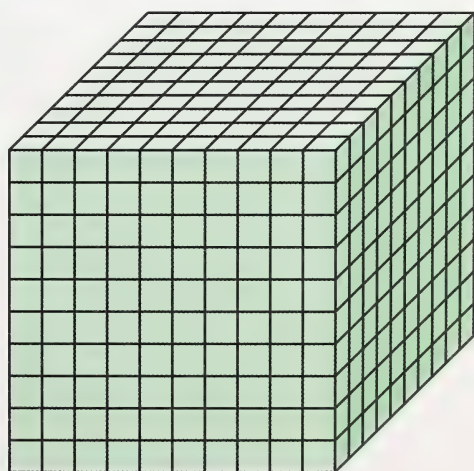
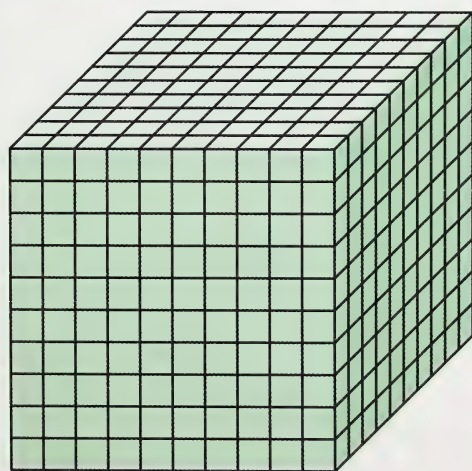
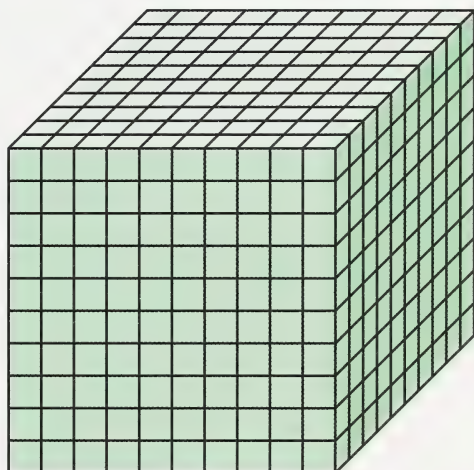
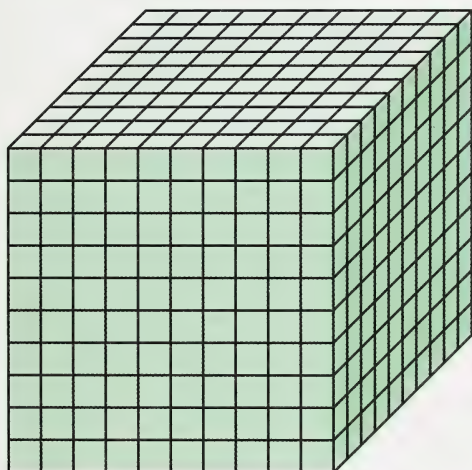
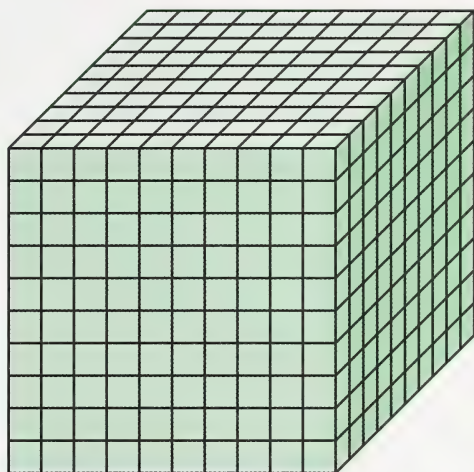
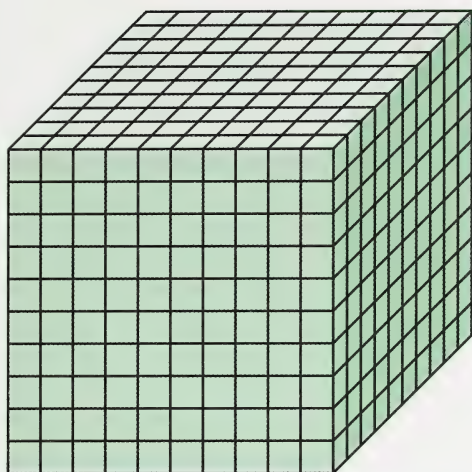
**Ones (1)**

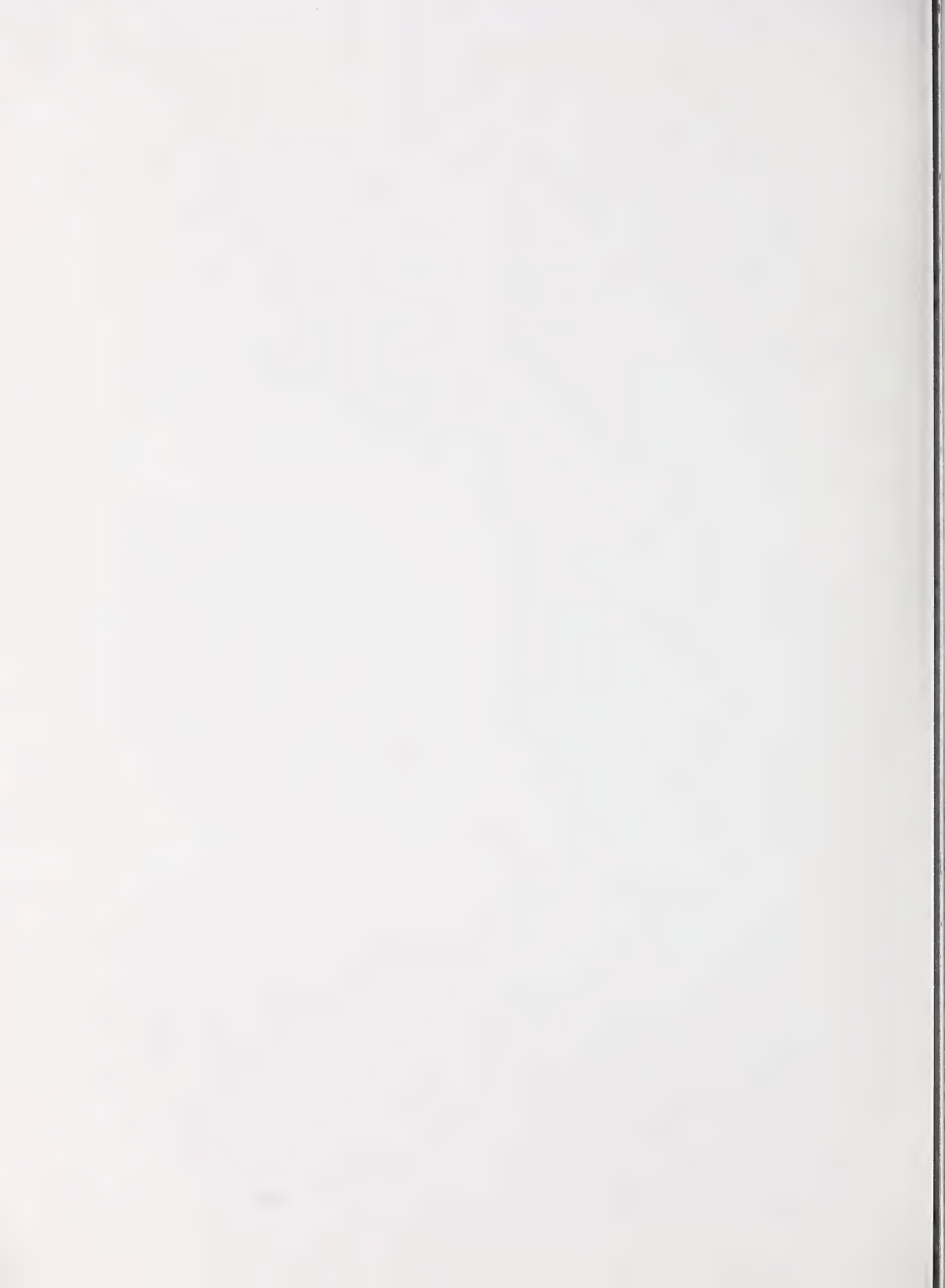
**TEN MAT**



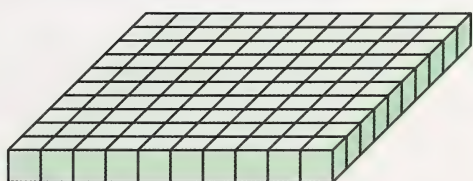
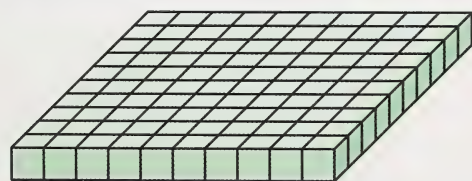
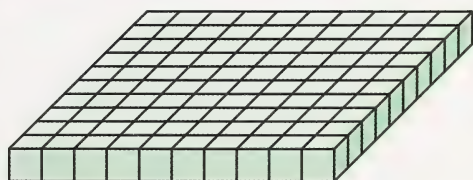
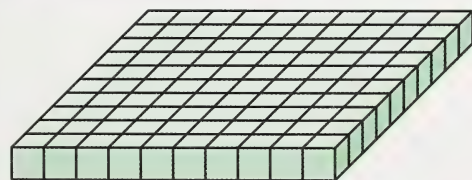
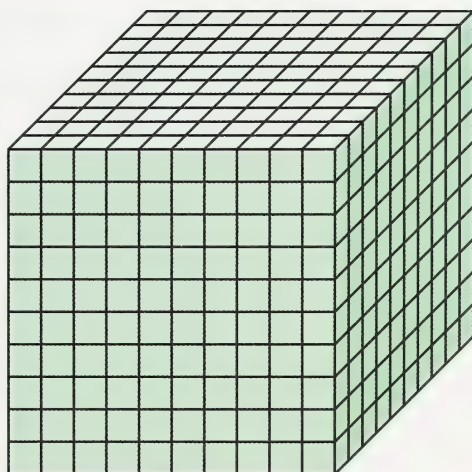
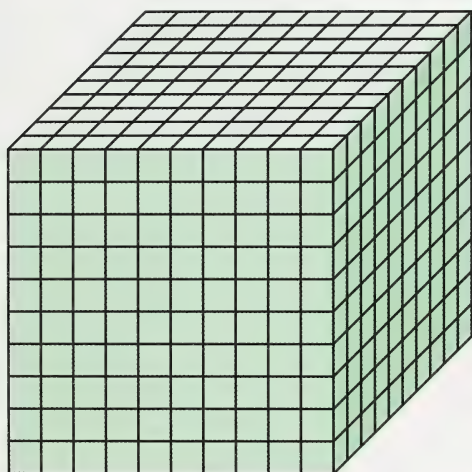
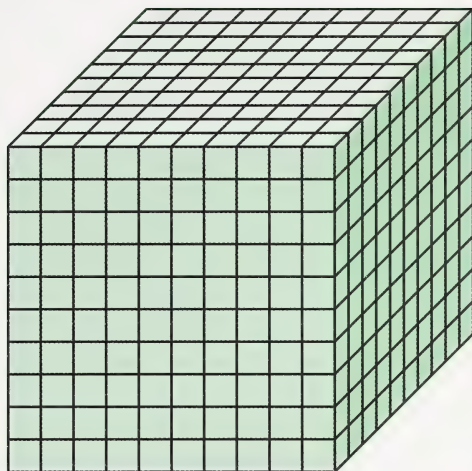
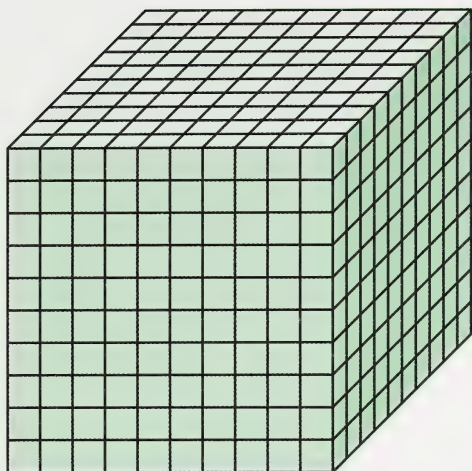


## Day 5: 3-D Base Ten Blocks





## Day 5: 3-D Base Ten Blocks (continued)



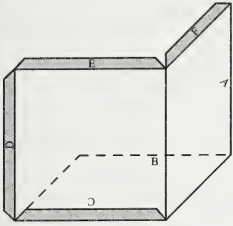




# Day 5: The Thousands Cube 3-D Model

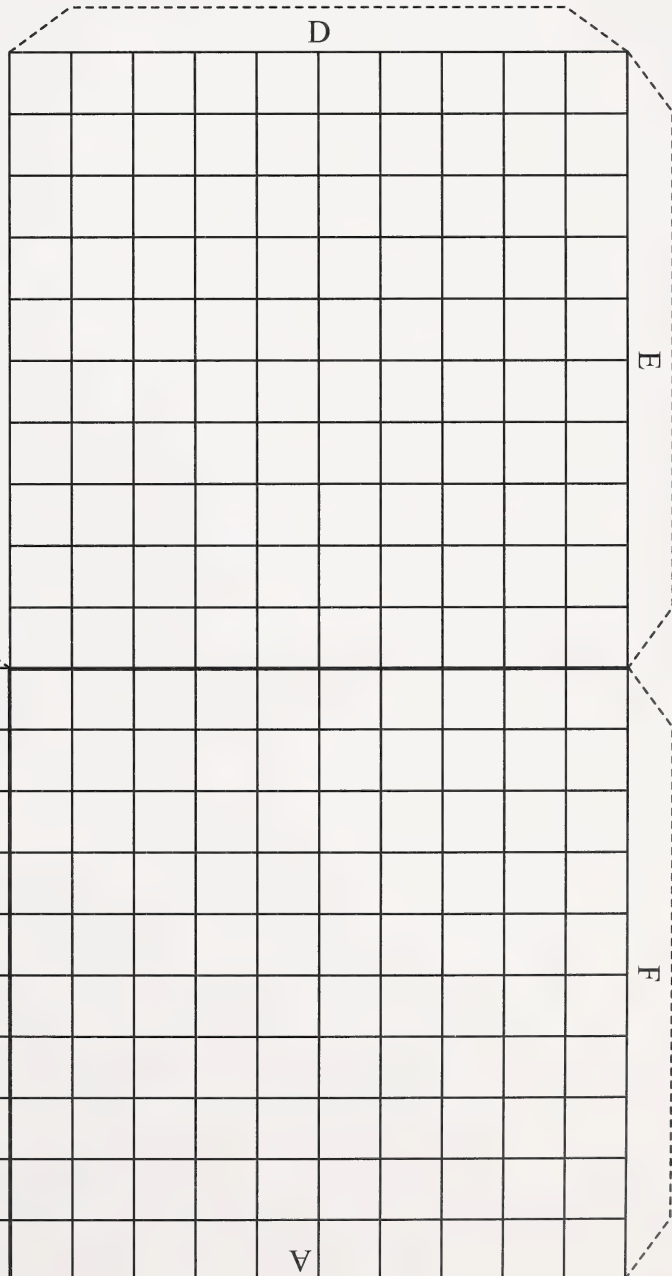
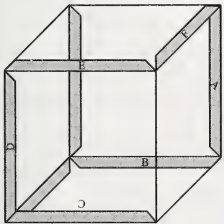
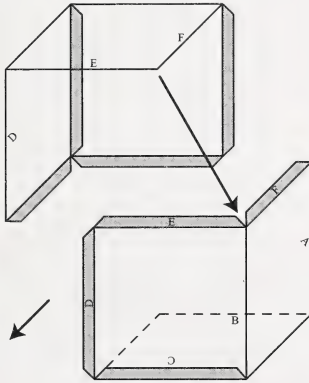
## INSTRUCTIONS:

1. The thousands cube model is made from two cut-out pieces. One half of the model is found below. The other half is found on the next page. Cut out both halves.



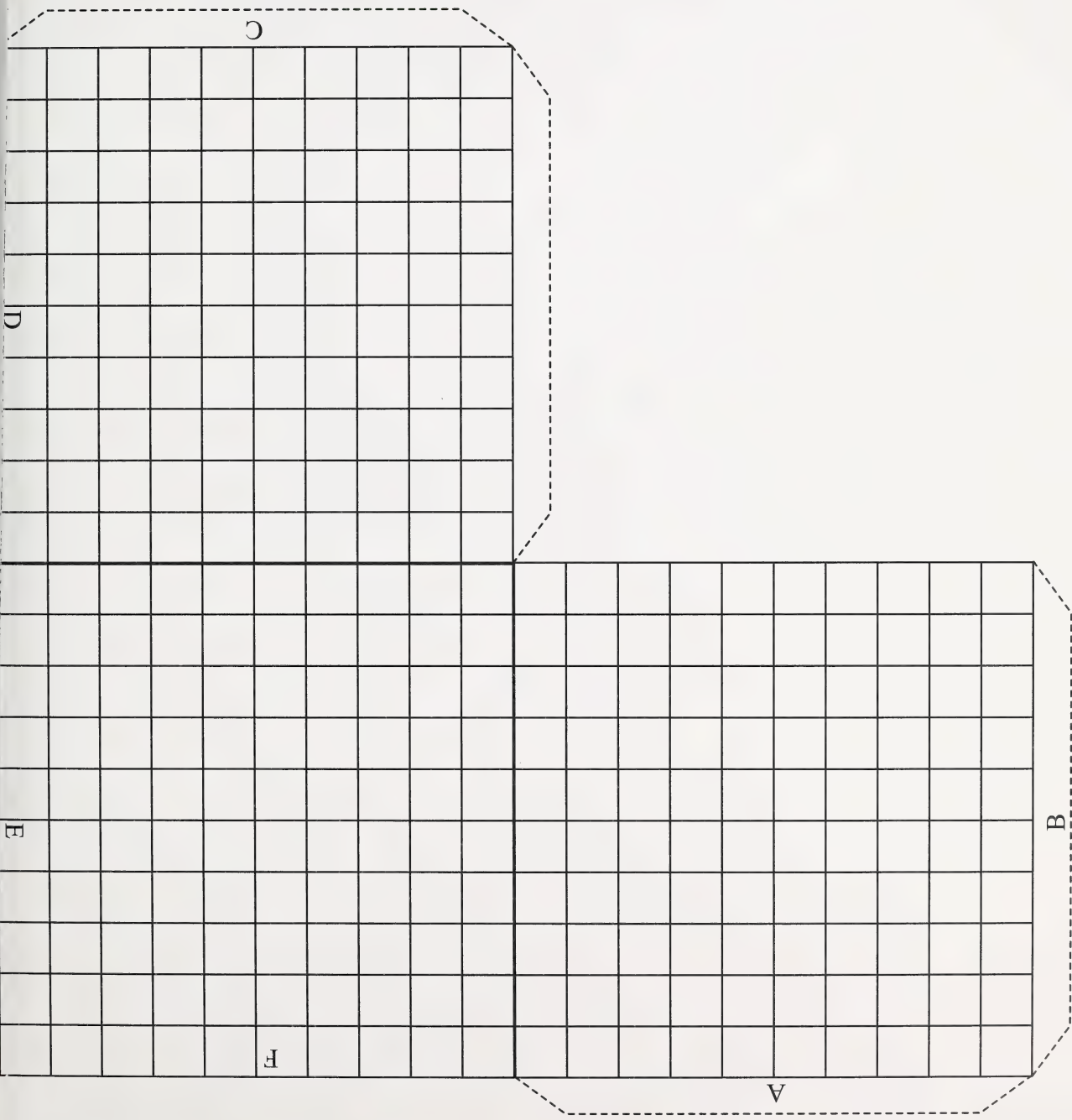
2. Fold each half so that the centimeter grid lines are on the outside. Tape or glue each to form two halves of a cube.

3. Tape or glue the two "halves" together like this:





Day 5: The Thousands Cube 3-D Model (continued)







Day 5: Base Ten Mat #2

<b>Thousands (1000)</b>	<b>Hundreds (100)</b>

↑ (Glue or tape second page here) ↑

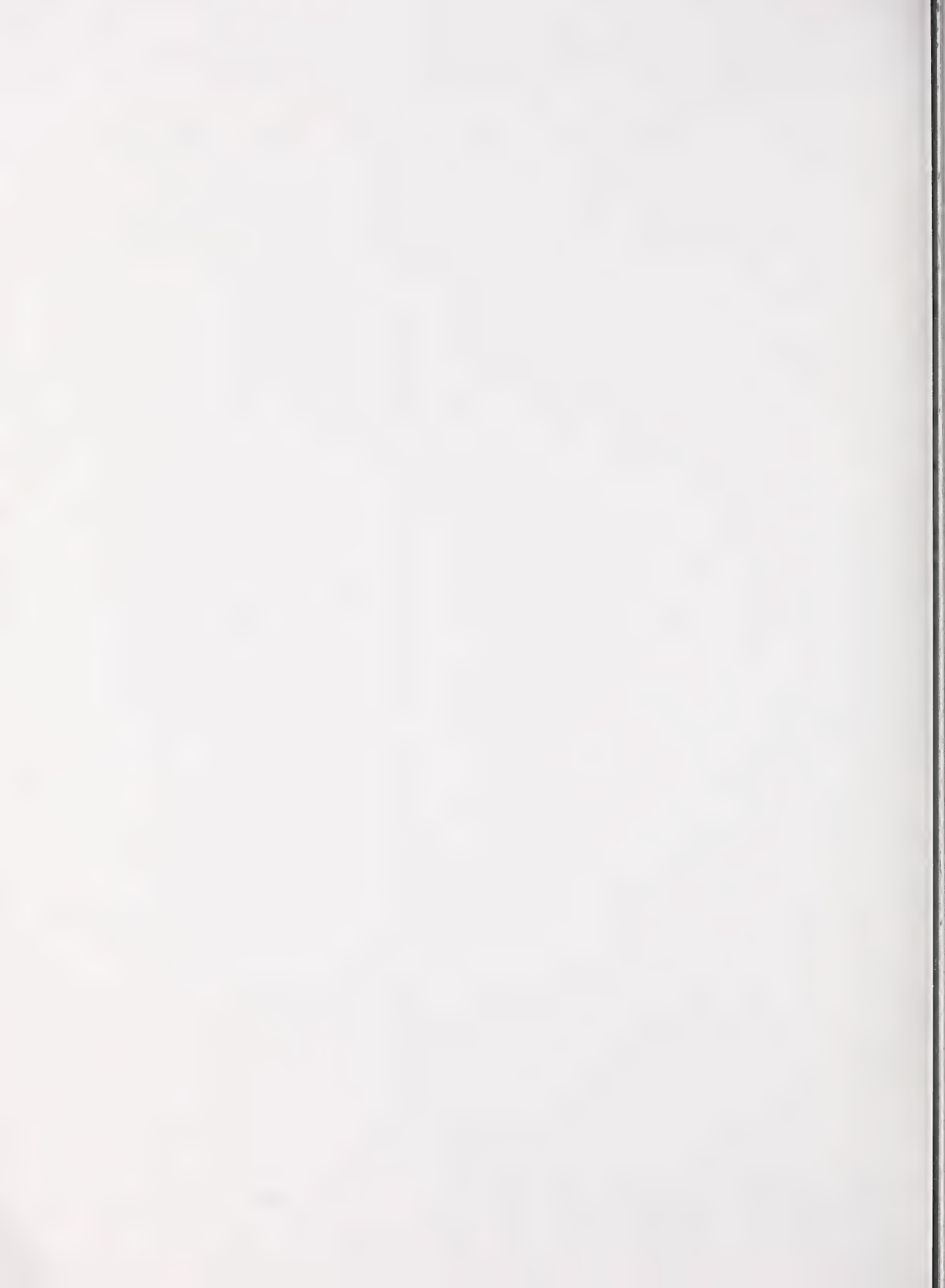
**BASE T**



Day 5: Base Ten Mat #2 (continued)

	<b>Tens (10)</b>	<b>Ones (1)</b>

**TEN MAT**





## Day 7: Number Cards 0 to 9

1

one

3

three

5

five

7

seven

9

nine

0

zero

2

two

4

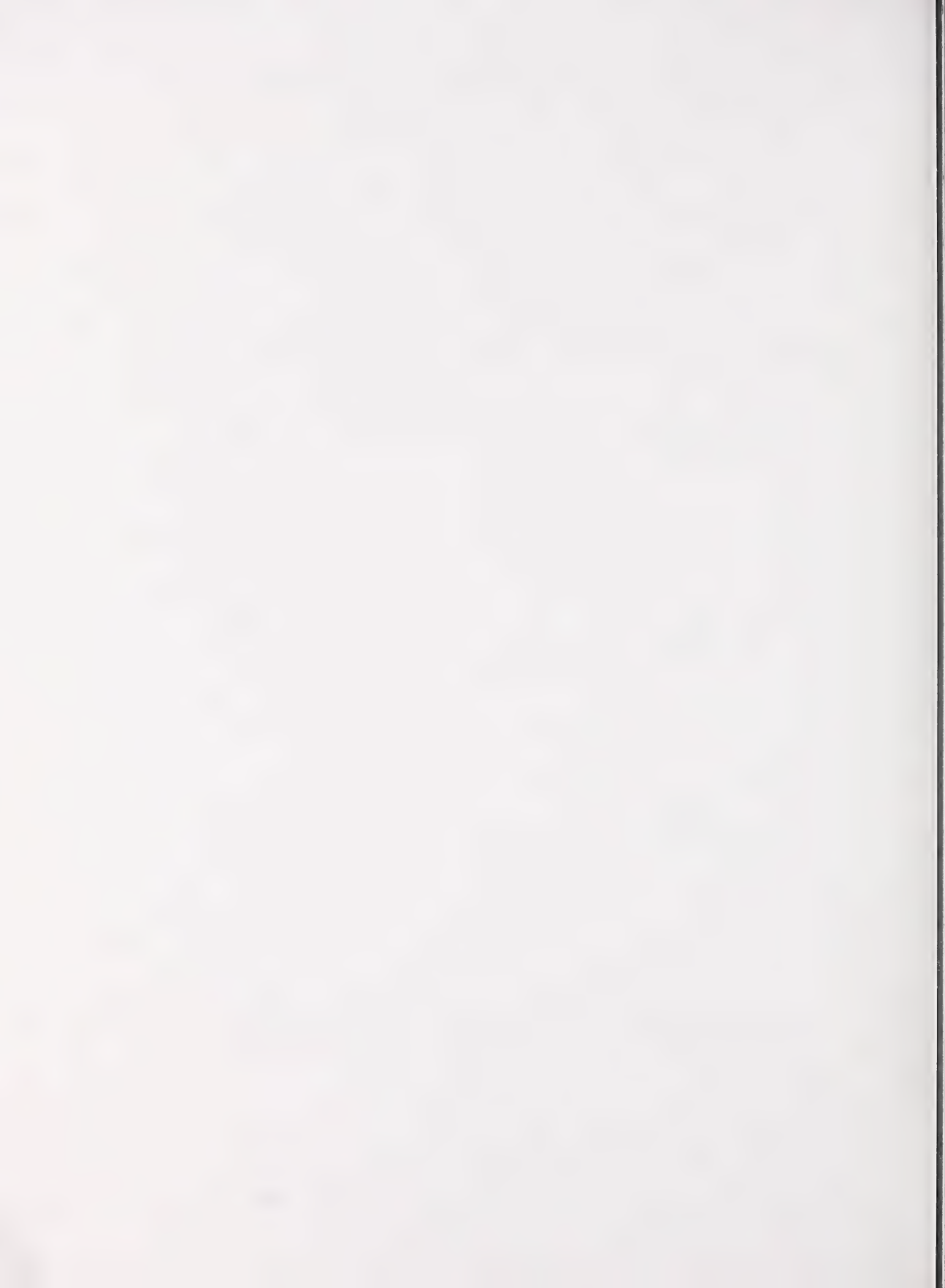
four

6

six

8

eight



## Day 7: Number Cards 0 to 9

1  
one

3  
three

5  
five

7  
seven

9  
nine

0  
zero

2  
two

4  
four

6  
six

8  
eight





## Day 7: Place-Value Cards

**1**

ones

**1**

ones

**10**

tens

**10**

tens

**100**

hundreds

**100**

hundreds

**1000**

thousands

**1000**

thousands

**10 000**

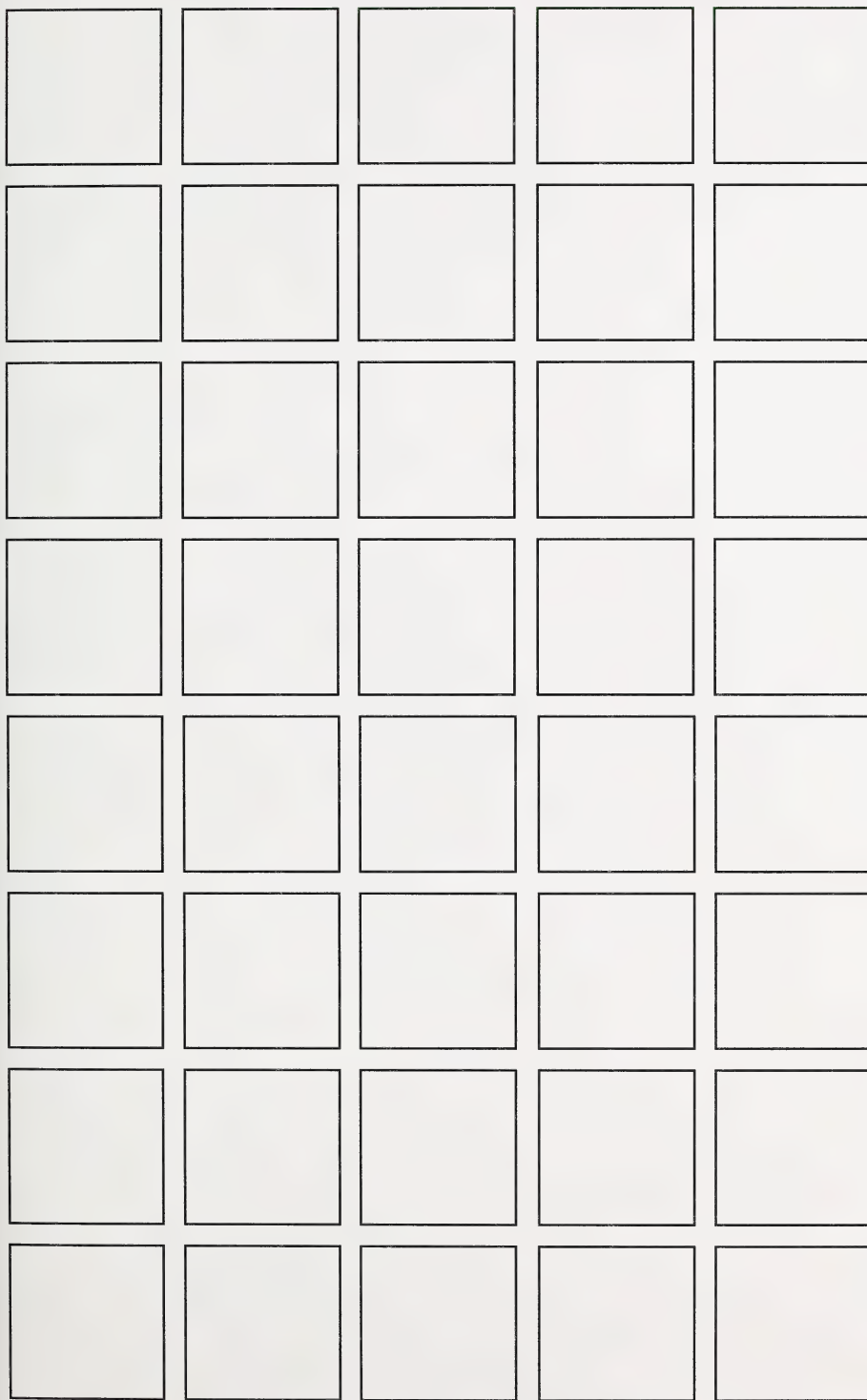
ten thousands

**10 000**

ten thousands



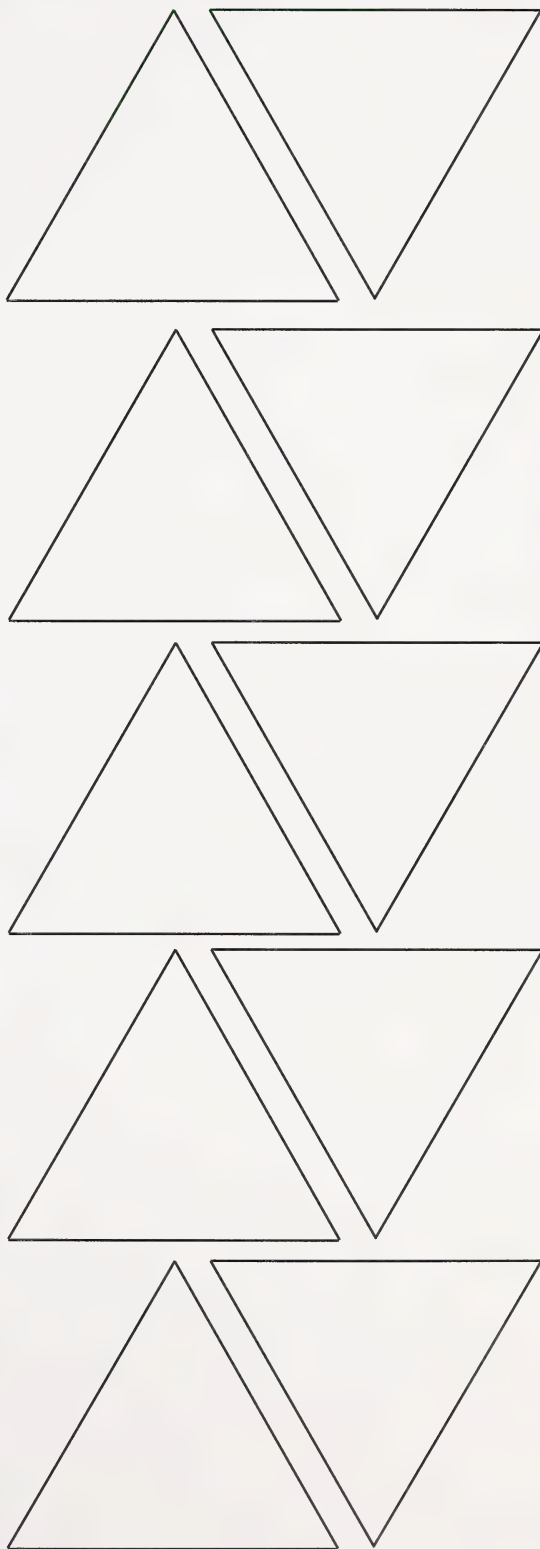
## Day 11: Squares and Triangles





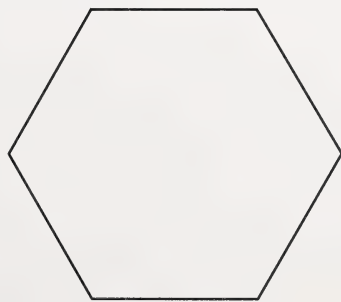
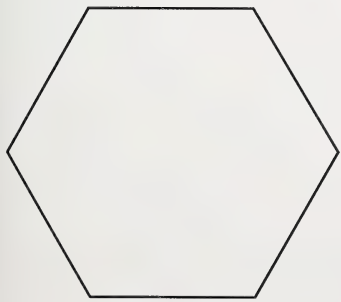
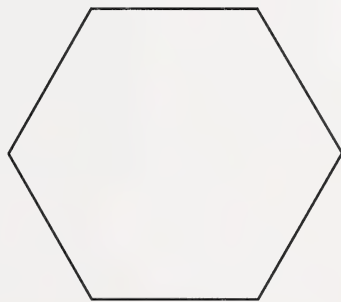
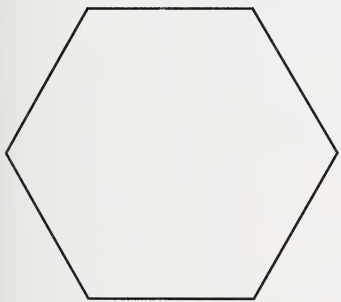
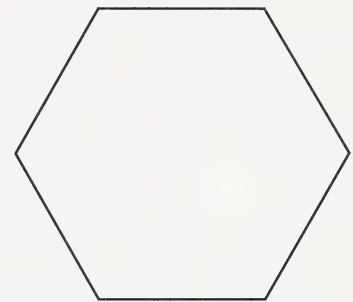
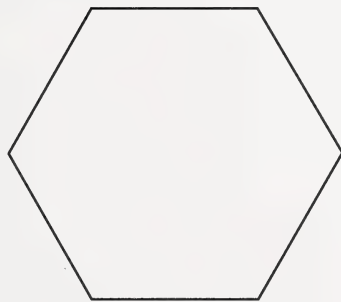
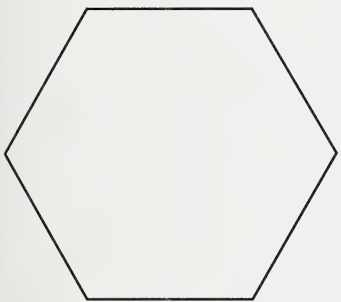
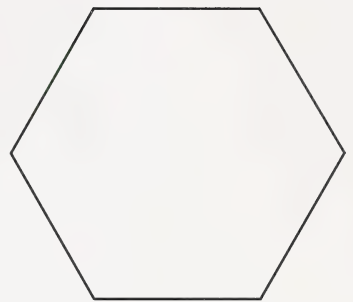
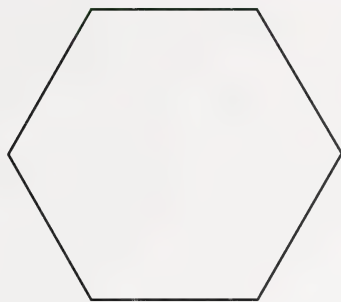
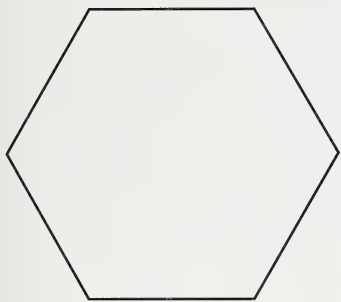


## Day 14: Rhombuses and Triangles





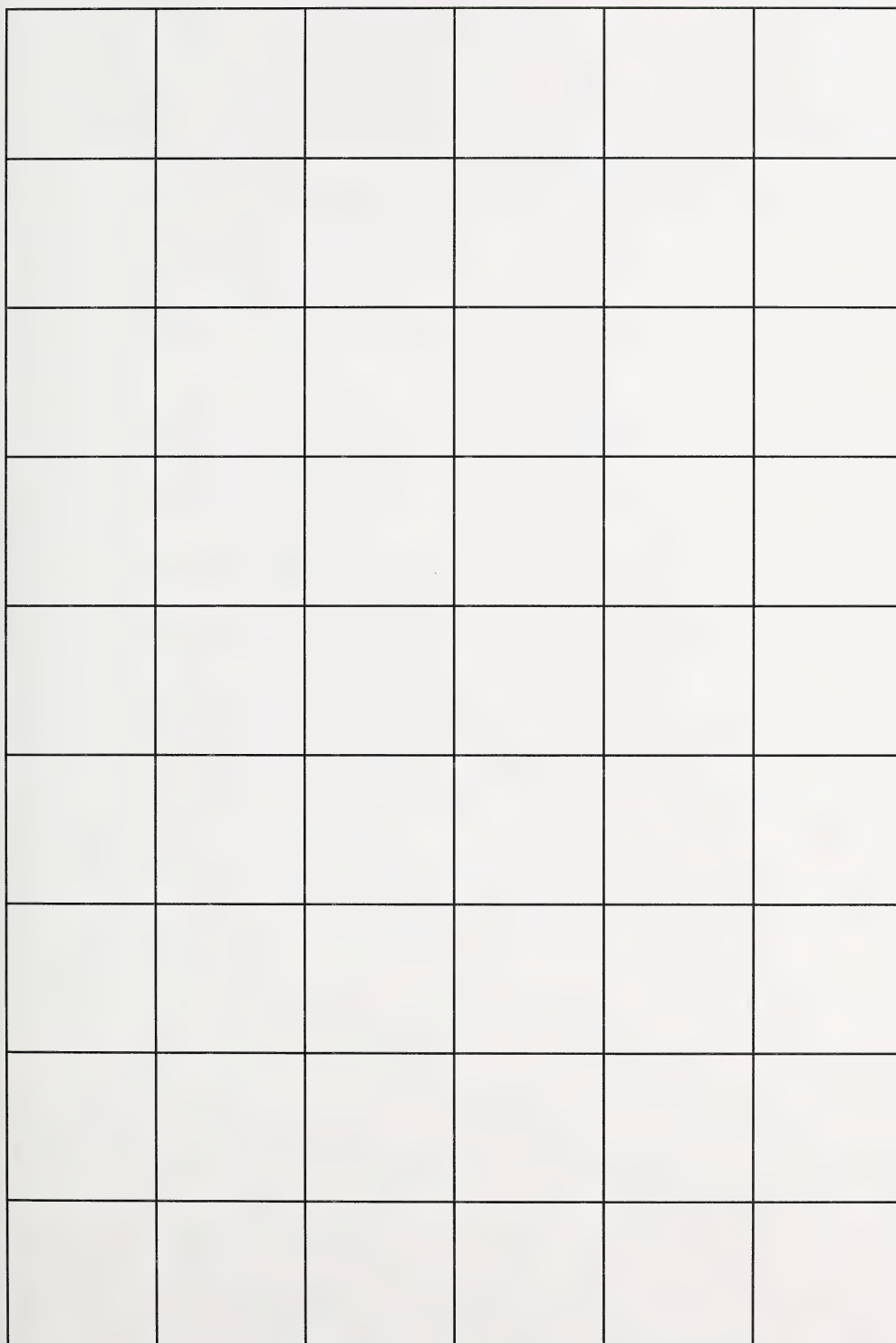
## Day 14: Hexagons







## Day 15: Squares





# Number Facts Progress Chart for Module 2

Your Score

